

**US Army Corps
of Engineers**

Kansas City District

**HISTORICAL ARCHAEOLOGY AT LOCALITY 6
OF THE FORT ELLSWORTH SITE (14EW26)
KANOPOLIS LAKE, ELLSWORTH COUNTY,
KANSAS**

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Kansas City District

Robert J. Ziegler, Principal Investigator and Editor

2001

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**HISTORICAL ARCHAEOLOGY AT LOCALITY 6
OF THE FORT ELLSWORTH SITE (14EW26)
KANOPOLIS LAKE, ELLSWORTH COUNTY,
KANSAS**

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Report Prepared by
U.S. Army Corps of Engineers, Kansas City District

2001

In memory of

Roger D. Grosser
(1944-1998)

Abstract

This report details archaeological investigations at Locality 6 of Fort Ellsworth (14EW26), a temporary military post established in 1864 and abandoned in 1867. The site is located along the Smoky Hill River within the present boundary of Kanopolis Lake in central Kansas. Locality 6 was tested in 1995, and as a result, the Fort Ellsworth site was determined eligible for the National Register of Historic Places in 1996. Data recovery investigations at Locality 6 in 1996 focused on the excavation of two dugout structures, both of which were found to contain evidence of walls constructed by setting logs vertically in a trench, a method known as *poteaux en terre* construction. One dugout contained the remains of a bakeoven, clearly indicating it was the post bakery. Archaeological data from the other dugout suggests that it served as a living quarters, probably for enlisted men or non-commissioned officers.

Archaeological data, in combination with historical documentation, have provided fresh new insights into everyday life at this obscure post. Shelter and other fort buildings were built by soldiers, primarily of materials readily obtained from the local environment--logs, brush, sod, and earth. In contrast to this poorly-developed built environment, the Army supplied Fort Ellsworth troops with up-to-date arms and other articles for military duty and daily existence. Soldiers also had access to a variety of foodstuffs that went well beyond the standard Army ration of the day issued by the commissary department. They enjoyed a diverse assortment of beef and pork (as well as chicken) dishes, and they certainly were not restricted to a consistent diet of low quality cuts of meat.

In the past, unauthorized artifact collecting and earthmoving activities have adversely affected portions of the site. Looters are still a threat, although signs have been posted and efforts have been increased to monitor the site. Riverbank erosion also poses a legitimate threat to some of the dugouts. For these reasons and the fact that much still can be learned, further archaeological data recovery is recommended. We still need to know more about the establishment of the fort, the subsequent growth and composition of the fort over time, the materials and means of construction of fort buildings, the supply of the fort, and the diet and everyday life of its residents.

Acknowledgments

Archaeology requires a team effort and I would like to acknowledge the efforts of those who participated in this study. First I would like to thank the 1995 field crew for their interest and enthusiasm in archaeological research. They include Kansas City District personnel Jim Bowen, Cynthia Dierks, Charlie Hall, Dan Hays, Brent Logan, Ken Lucius, Shirley Muirhead, Teresa Rasmussen, Charlie Stegner, Marcia Thomas, and Kipp Walters, as well as volunteer Scott Lucas. Ken deserves particular mention for helping with project preparations and assisting with supervising the excavations. The late Roger Grosser provided important archaeological expertise and helped to supervise the 1995 work as well. Without his initial support the project would not have happened.

Fort Ellsworth and nearby Fort Harker served as sites for the 1996 Kansas Archaeological Training Program. This study has profited from the many talents of staff from the Kansas State Historical Society including Verna Detrich, Anita Frank, Marsha King, Karolyn Kinsey, the late John Reynolds, Chris Schoen, Martin Stein, Barry Williams, and Virginia Wulfsuhle. I would like to thank Virginia, in particular, for her skill in organizing and getting things done. Over 180 volunteers participated in the 1996 program and it is not possible to mention everyone by name but I do appreciate the interest and effort these folks put forth. Special thanks go to the Kansas Anthropological Association, a quality organization with many talented people. Thanks, in particular, to excavation team leaders Greg Jackson and Ken Sherraden, for their quality work and tireless efforts in the excavations at the two dugouts, and also to Mary Conrad who supervised the initial laboratory processing of recovered artifacts. I also am indebted to Bob Brock, principal of Kanopolis Middle School for making the school available for a field lab and base of operations.

I would like to thank the authors of the major analyses in this volume. Mary Adair, Cynthia Baer, Rob Bozell, Steve De Vore, and Rich Fox all have made significant contributions. And thanks also to Mike Finnegan for applying his osteological expertise.

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Particular thanks go to Jim Gray and Marcia Thomas. They brought the site to our attention in the early 1990s and both have freely assisted with the project over the years. Their dedication has helped save a piece of Kansas' history.

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RJZ
December 2000

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CHAPTER 1

INTRODUCTION

by

Robert J. Ziegler

Lieutenant Frank Baldwin of the 37th U.S. Infantry married Alice Blackwood in Northville, Michigan on January 10, 1867. The following week, the Baldwins visited family and friends in Michigan and then embarked on a long journey to Frank's assigned duty station in central Kansas. The couple traveled by rail to Chicago, then to St. Louis, and finally to Junction City, Kansas, the terminus of the Kansas Pacific Railroad. From there, the couple traveled by ambulance to Fort Riley, then to Salina, and ultimately to their final destination, Fort Harker (Carriker 1975:24-27; Steinbach 1989:26-27). At that time, the fort was under construction and the bride was astonished when she discovered that the couple's quarters at Fort Harker were not yet completed and that they would have to stay nearby in quarters at the "lower cantonment" located along the Smoky Hill River (Baldwin 1928:126; Steinbach 1989:27). In her memoirs, Alice Blackwood Baldwin describes her initial approach to the site:

I could see no buildings, nor any sign of a fort until it was pointed out to me, but still could see nothing but a spot elevated slightly above the rest of the landscape.

A nearer approach disclosed a short stub of stovepipe, although no smoke issued from its top. Presently I saw other discolorations in the landscape which proved to be the barracks and officers' quarters. The so-called barracks were mostly dug-outs, but God be praised! there floating in the storm was Old Glory (Baldwin 1928:121-122).

The lower cantonment described by Mrs. Baldwin was actually old Fort Ellsworth, established in June 1864 to secure routes of transportation and protect local settlements from Indian attacks. Company H of the 7th Iowa Cavalry, under the command of Second Lieutenant Allen Ellsworth, constructed the fort near the junction of two trails, the Smoky Hill/Denver Express Road, and the Fort Riley/Fort Larned Road (also known later as the Fort Zarah Road) (Mattes 1947:12; Lees and Schockley 1986:127). Intended to be only temporary, the fort consisted of a loosely organized collection of dugout and log facilities and quarters constructed mainly from materials at hand. In November 1866, Fort Ellsworth was renamed Fort Harker, and by the spring of 1867 the old fort along the river was abandoned for the newly-built post situated on higher ground approximately one mile to the northeast in what today is the town of Kanopolis. In June 1867, just three years after Fort Ellsworth's establishment, its buildings were ordered razed to the ground (Choitz 1967:7). Its successor, Fort Harker, protected the trails and local settlements, as well as construction crews of the Kansas Pacific Railway as it advanced west. During the Indian wars of 1868-1869 it served as the base of expeditions against the Cheyenne, Commanche, and the Arapaho. Fort Harker became the main distributing point for all of the military posts further west, but after Indian troubles subsided and the railroad was completed to Denver, the decision was made to abandon it. The last regular troops occupied the

fort until October 1872 although it was temporarily reoccupied during the winter of 1872-1873 (Lees and Schockley 1986:21-23).

Fort Ellsworth, over the course of its short existence, was garrisoned by anywhere from 1-7 companies (average=2.9) of cavalry and infantry (National Archives 1965). A succession of state and Federal troops served there, including Company C of the 2nd U.S. Volunteers, one of the units of "Galvanized Yankees," or Confederate prisoners who earned their release from prison by volunteering for Western duty (National Archives 1965; Brown 1986). Notable individuals associated with Fort Ellsworth include Wild Bill Hickok and Buffalo Bill Cody. In his autobiography, Buffalo Bill Cody (1991:145) recalled that Wild Bill Hickok was headquartered at Fort Ellsworth while scouting for the Government in the winter of 1866-1867. At that time, Buffalo Bill obtained employment at Fort Ellsworth and subsequently scouted between it and Fort Fletcher (Cody 1991:145).

Fort Ellsworth is little more than a footnote in most histories of Kansas, the American West, or the Plains Indian wars. It existed for only three years and no battles were fought from its confines, or for that matter, anywhere near the fort. To date, no history of the fort has been written, consequently neither historians nor the general public know very little about it and the daily life of its inhabitants. Historical documentation on this obscure post is available though. There exists a handful of first-hand accounts written by individuals stationed at the fort or passing through the area. There also exists a sizable number of official military letters, orders, and documents, enabling one to begin to piece together the fort's history. However, this historical record is incomplete, and moreover, inconsistent concerning a number of facts. Nearly all of the fort's records have been lost for the 1 1/2 year period beginning with the fort's founding in June 1864, and ending in November 1865. Surviving maps present conflicting versions of one of the most basic facts, the actual location of the fort. And despite an extensive search at the National Archives and other libraries during the course of this study, no documents could be found showing the fort's layout, and only one depiction of any fort building, the sutler's store, could be found.

Today, an estimated 85% of the Fort Ellsworth site (14EW26) is located on Government-owned land at Kanopolis Lake, a multipurpose project of the U.S. Army Corps of Engineers, Kansas City District (KCD) (Figure 1.1). The remainder of the site lies on adjacent private lands. No fort structures have survived and the only physical evidence of the fort's existence that one can observe today are subtle depressions indicating where buildings once stood, and a few mid-19th century artifacts scattered about on the surface of the ground. However, the site is well known locally and looting by artifact hunters threatens the integrity of the site. Several collections in the possession of local residents reportedly have been excavated from Fort Ellsworth. During inspections of the site by KCD archeologists and Kanopolis Lake rangers, holes dug by metal-detector using artifact collectors were encountered on several occasions. Fencing that includes a locked gate prevents direct vehicle access to the site, but artifact hunters still find means of entry by foot or by vehicle via private land.

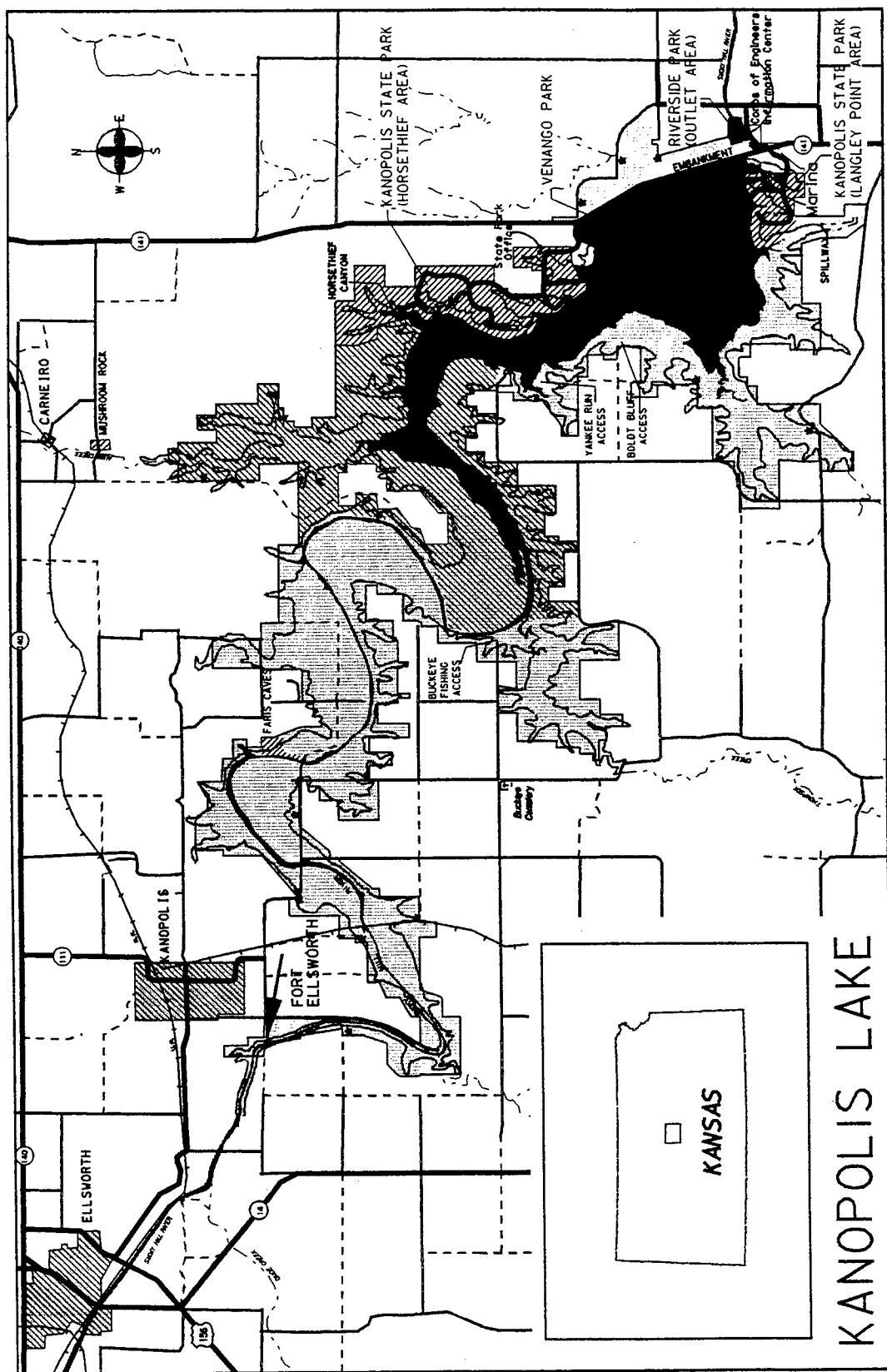


Figure 1.1. Map of Kanopolis Lake showing the location of Fort Ellsworth (14EW26).

Destruction of potentially significant archaeological remains prompted the KCD to conduct test excavations at the site in the summer of 1995. The 1995 investigation, directed by the author, determined the existence of undisturbed archeological features and artifact deposits probably associated with the occupation of Fort Ellsworth (Ziegler 1996). Based on the 1995 archeological testing, the KCD and the Kansas State Historic Preservation Officer (SHPO) concluded that 14EW26 is eligible for listing to the National Register of Historic Places (NRHP) because it is likely to yield archeological data important to the understanding of the material aspects of everyday life at a small, temporary military fort on the Kansas frontier.

In 1996, the KCD and the Kansas SHPO determined that data recovery was the best means to preserve important information before it is lost to artifact collectors. A Data Recovery Plan (Ziegler 1996) was completed in February, and in the spring of that year a geophysical investigation was conducted by Steven DeVore of the National Park Service (DeVore, Appendix A), while comprehensive historical research was undertaken by historian Cynthia Baer of American Resources Group, Ltd. (Baer, Chapter 2). Data recovery investigations at 14EW26 directed by the author in the summer of 1996, along with survey and test excavations at nearby Fort Harker (14EW310) directed by Marsha King of the KSHS (King 1997), were undertaken as components of the Kansas Archaeological Training Program, sponsored that year by the Kansas State Historical Society (KSHS), the Kansas Anthropological Association (KAA), and the KCD.

Fort Ellsworth presented an excellent opportunity to study the past using a variety of sources. Historical documents were critical to the understanding of the fort's past, but they simply did not tell the whole story. Excavated archaeological remains provided details that did not exist in the historical record, and archaeological and historical sources when used in combination, provided a much fuller interpretation of the past that could be provided by either type of source alone (c.f., Deetz 1988; Deagan 1991; Yentsch 1994).

This volume reports the 1995-1996 archaeological investigations at 14EW26. The remainder of this chapter outlines the environmental setting, discusses research at the site before 1995, presents research questions to be addressed during this study, and describes the study methods. Chapter 2 provides a detailed history of the fort. Chapter 3 discusses the results of the archaeological investigations. Specialized analyses of recovered material remains follow in Chapter 4 (non-organic artifact assemblage), Chapter 5 (faunal remains), and Chapter 6 (botanical remains). Chapter 7 evaluates the research questions. The last chapter summarizes the study's conclusions and makes recommendations for further work. Finally, separate appendices detail the geophysical investigations, prehistoric artifacts, human remains, and historic artifacts by major proveniences.

Environmental Setting

The site is located in Ellsworth County in central Kansas in the physiographic region known as the Smoky Hills. This region consists of a broad belt of hills formed by the dissection of Cretaceous rock units. The site is located in the easternmost range of the Smoky Hills, commonly known as the Dakota Hills because that are capped by thick red sandstones of the

Dakota Formation. Hills and buttes that abruptly rise above the surrounding plains characterize the Dakota Hills (Wilson 1984:24). Rivers in the region-- the Republican, Solomon, Saline, and Smoky Hill-- flow eastward across the Smoky Hills. Wide, flat floodplains and bench-like alluvial terraces characterize the river valleys.

The site is located in the vicinity of the confluence of the Smoky Hill River and Spring Creek, on the east bank of the Smoky Hill and on both sides of Spring Creek (Figure 1.2). Presently, the area is timbered along the streams with unbroken prairie and cultivated fields beyond the timber. The native vegetation of the site area would have been floodplain forest surrounded by a mosaic of Bluestem prairie and Bluestem-grama prairie (Kuchler 1974).

The floodplain forest would have included tall, medium-tall, and low broadleaf deciduous scattered trees and shrubs. Dominant species along the floodplain would have been hackberry, cottonwood, black willow, and American elm (Kuchler 1974:600-601). Bluestem Prairie in the site vicinity would have consisted of dense stands of tall and medium-tall grasses and forbs, with big bluestem, little bluestem, switchgrass, and Indian grass as dominant species. Bluestem-Grama Prairie would have consisted of two communities, dense stands of low-growing grasses, or dense stands of medium-tall grasses and forbs. Big bluestem, little bluestem, sideoats grama, and blue grama would have been the dominant species (Kuchler 1974:591-597).

Soils in the site vicinity are of the McCook, Tobin, or Jansen series (Barker and Dodge 1989). McCook loams and silt loams are present on the floodplains and terraces of the Smoky Hill River while Tobin silt loams are found on the narrow floodplains of Spring Creek. Formed in loamy sediments over alluvial sand and gravel, Jansen sandy loams are present in the uplands bordering both the Smoky Hill River and Spring Creek.

Previous Archeological Research at Fort Ellsworth

Fort Ellsworth received limited attention during archeological investigations conducted by the University of Kansas at Kanopolis Lake in 1948 (Smith 1949). Smith reported on a number of prehistoric sites investigated during the project, and although he did not discuss Fort Ellsworth in the 1949 report, a large surface collection and associated artifact catalog curated at the University of Kansas indicates that he visited the site. Metal artifacts in the collection include lead bullets, lead sprue, copper cartridge cases, percussion caps, military insignia, military buttons, small buckles, bridle parts, harness parts, tin can fragments, door hinges, cut nails, and miscellaneous unidentified iron fragments. The collection also includes a variety of earthenware, stoneware, and bottle glass fragments. Records associated with this collection do not indicate the boundaries of the site nor do they specify the location(s) where these materials were found.

The late George Jelinek, a local amateur historian, excavated at the Fort Ellsworth site prior to 1974. In a book on the local history of the area he provides a very brief account of digging into the foundation remains of a building believed he believed to be the fort's commissary (Jelinek 1973). A small collection of artifacts resulting from this excavation resides in the Ellsworth County Museum in Ellsworth. Unfortunately, according to the museum's

director there is no accompanying documentation with the artifact collection, nor are there any records of Jelinek's excavation work. Jelinek's sister-in-law, Inez Fox, was contacted and she was not aware that Jelinek kept any logs or diaries of his excavations (Charles L. Fulford 1993, pers. comm.).

In 1976 Fort Ellsworth was revisited during a shoreline survey of Kanopolis Lake conducted by the University of Kansas (Leaf 1976, 1977). Both prehistoric and historic artifacts were recovered from the surface of cultivated fields and river terraces at three localities near the confluence of Spring Creek and the Smoky Hill River (Leaf 1977:46). The three localities are shown in Figure 1.2; Locality A is located west of Spring Creek, while Locality B lies east of Spring Creek, and Locality C is located along the Smoky Hill River adjacent to a modern sand pit. The 1976 collection consists of a lead bullet, an iron trouser button, a knife tip, a small buckle, a horseshoe, a door hinge, a cut nail, window glass, bottle glass, earthenware, stoneware, clinkers, and miscellaneous iron fragments. Leaf's (1976, 1977) reports do not indicate the location (i.e., either Locality A, B, or C) where any given artifact was collected.

Additional survey work and limited testing were conducted in the Fort Ellsworth vicinity by Environmental Systems Analysis, Inc. in 1984 during their historical and historical archeological study of Kanopolis Lake (Lees and Schockley 1986). Two sites recorded during the survey are associated with the military road that ran from Fort Riley to the confluence of Walnut Creek and the Arkansas River. This road was known variously as the Santa Fe Road, the Fort Riley Road, and the Fort Larned Road prior to the construction of Fort Zarah in 1864, when it became known as the Fort Zarah Road. The remains of a government bridge and the Fort Zarah Road (14EW105), were recorded (Figure 1.2). The bridge was built in 1854 or 1855 and was destroyed either in 1858 or 1865 (Lees and Shockley 1986:150). Bridge pilings in the Smoky Hill River bed, earthen approach ramps on both sides of the river, and a section of the Fort Zarah Road on the east bank of the river are still preserved. The other recorded site (14EW106) is the probable Smoky Hill Ford and Fort Zarah Road located some 200 m downstream from 14EW105 (Figure 1.2). After the government bridge was destroyed, the Smoky Hill Ford served as the crossing for the Fort Zarah Road (Mattes 1947:2). Physical evidence of the ford no longer exists, but investigators hypothesized that a 300 m long ravine on the west bank of the river carried the ford; on the east bank there is a segment of the Fort Zarah Road leading up from the probable location of the ford (Lees and Schockley 1986:150-151).

Fort Ellsworth was built on the site of the Page and Lehman ranch, abandoned in 1864 because of Indian attacks (Lees and Schockley 1986:21). Deeds and abstracts indicate that Joseph Lehman bought land from the U.S. Government on the north side of Spring Creek in Sections 35 and 36, T15S R8W (Lees and Schockley (1986:127). The 1984 field survey resulted in the identification of five localities, all within those two sections, that may represent the possible remains of Fort Ellsworth (Lees and Schockley 1986:126-137) (Figure 1.2). Locality 1 is located within the bounds of Locality B as defined by Leaf (1976, 1977) and consists of a moderate density scatter of historic artifacts. Locality 2, just to the north of Locality 1, is a light density scatter of historic artifacts; Locality 2 is partially on Government land. Locality 3 is partially on Government land and consists of at least one well-defined dugout, and possibly, additional dugouts. Locality 4 is entirely on private land and consists of five well-defined

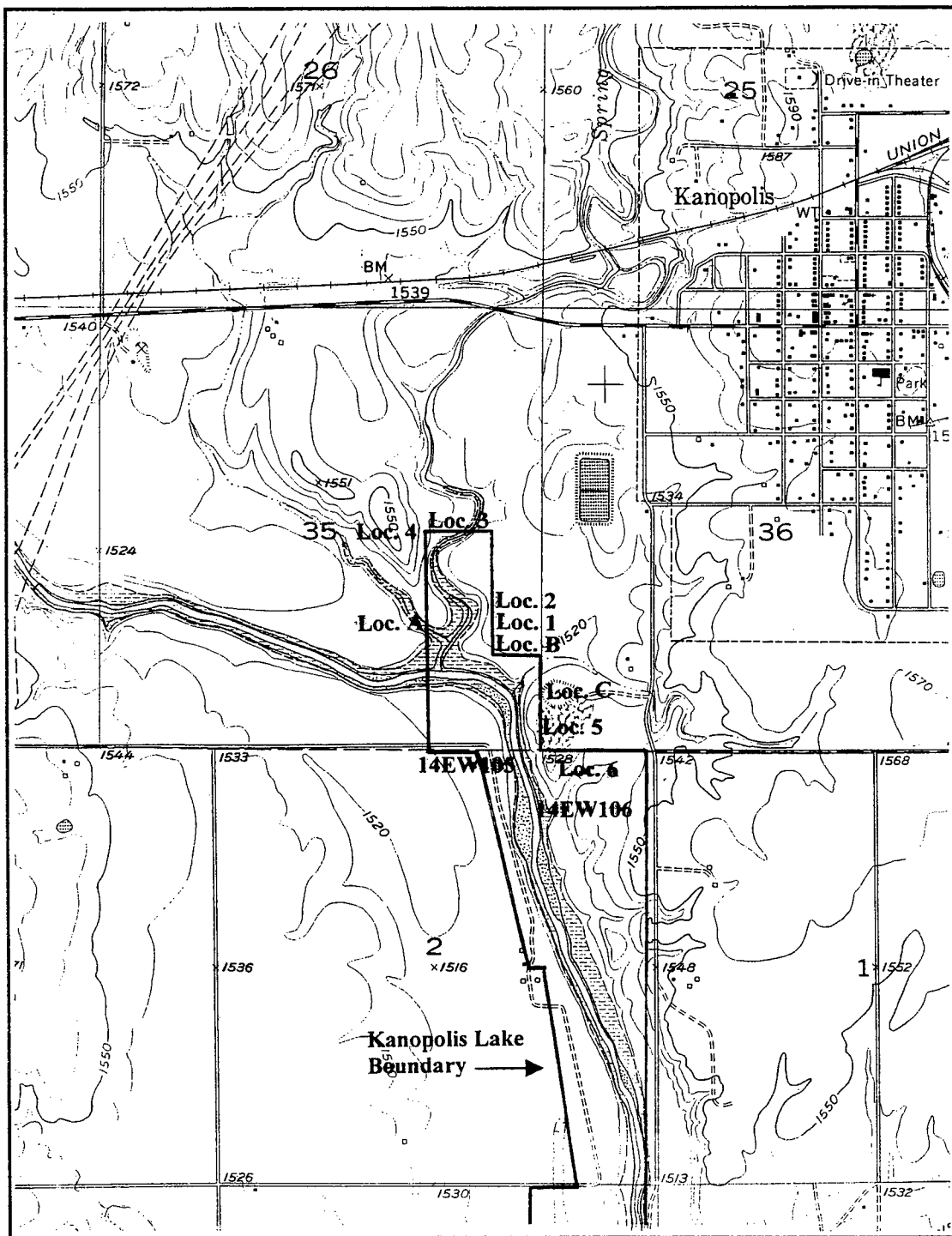


Figure 1.2. Approximate locations of the nine localities of Fort Ellsworth (14EW26) and associated sites 14EW105 and 14EW106. Source map: Ellsworth U.S.G.S. quad., revised 1979, scale 1 in. = 2000 ft.

dugouts. Locality 5, a scatter of artifacts west of the sandpit, partially overlaps Leaf's (1976, 1977) Locality C.

During the 1984 investigations, artifacts were recovered from the surface of Localities 1 and 2, and from four 1 x 1 m test units placed in Locality 1. A 1 x 1 m test unit placed in front of the dugout in Locality 3 failed to produce any cultural materials. Testing within the dugout at Locality 3 and the dugouts at Locality 4 was not attempted because they are located on private land. Locality 5 was thought to have been seriously disturbed from the adjacent sand pit operation and therefore was not tested either (Lees and Schockley 1986:126-137)

At Locality 1, artifacts recovered from the surface include a variety of 19th century items: a cut nail, an iron four-hole trouser button, an aqua bottle finish, and a number of fragments of olive bottle glass, a type of glass typical on sites dating to the first three-quarters of the 19th century (Lees and Schockley 1986:130). Tests at Locality 1 also recovered several 19th century items including cut nails, aqua bottle glass fragments, and olive bottle glass fragments (Lees and Schockley 1986:Table 19). At Locality 2, several olive bottle glass fragments recovered from the surface are suggestive of a date to the first three-quarters of the 19th century (Lees and Schockley 1986:132). The single test unit placed in front of a dugout at Locality 3 failed to recover any cultural material (Lees and Schockley 1986:132).

The 1984 investigations at Fort Ellsworth were inconclusive. None of the observed artifact scatters could, with certainty, be associated with Fort Ellsworth. All lacked definite military items and could just as easily have been associated with the use of the Smoky Hill Trail/Denver Express Road or the Fort Zarah/Santa Fe Road (Lees and Schockley 1986:136). Similarly, no archeological evidence could be found to link the dugouts to Fort Ellsworth. Part of the problem is the fact that the dugouts lie on private land and could not be tested. Nevertheless, the investigators speculated that these dugouts, situated on the south slope of the most prominent hill in the area, could be the site of Fort Ellsworth (Lees and Schockley 1986:136-137).

More recently, local amateur archaeologist Harvey Rogers found 19th century historic artifacts at several sites located west and southwest of the confluence of Spring Creek and the Smoky Hill River. A brass military button was recovered from the surface of only one site and no structural remains were observed at any of the sites recorded (Harvey Rogers, pers. comm., 1996; KSHS archaeological site files). (These sites lie on private property and were not investigated during this study, however further investigation is recommended to fully investigate potential ties to Fort Ellsworth; see Chapter 8).

Between 1990-1994 the KCD conducted additional survey in the vicinity of the old government bridge site and Fort Larned/Fort Zarah Road (14EW105). In 1990, Corps archeologist Roger Grosser, with assistance from Corps rangers Marcia Thomas and Jim Gray, identified a new locality in Section 2, T16S R8W that ultimately became the focus of the 1995-1996 excavations (Figure 1.2, Locality 6). There, in the vicinity of the government bridge site and Fort Larned/Fort Zarah Road (14EW105) and a stone marker commemorating the Butterfield

Overland Dispatch route, they identified surface indications of dugouts along the riverbank as well as a 30 x 50 ft. shallow depression on a knoll overlooking the dugouts that was thought to represent the location of a fort building, possibly the blockhouse or commissary (Figure 1.3). In addition, 19th-century bottle glass and machine-cut nails were found eroding from one of the dugouts. Between 1991-1994, the writer visited Locality 6 several times. During these visits, additional artifacts were recovered from the surface including black (olive-green) bottle "finishes," a tin can lid from a hole-in-cap type can, machine-cut nails, and an 11/16 in. diameter four-hole tinned-iron two-piece button. All artifacts recovered between 1990-1994 are consistent with a 19th century occupation, and the bottle finishes, in particular, date to the third quarter of the 19th century. Again, not one of the artifacts is a definite military item.

Possible physical evidence of Fort Ellsworth at Locality 6 was especially perplexing since previous investigators (Mattes 1947; Leaf 1976, 1977; Lees and Schockley 1986) found no physical or documentary evidence for the fort in that location. Only the late historian Howard Raynesford, who meticulously researched the Smoky Hill Trail for some 44 years, suggested that possibility, placing the fort on the north side of the Smoky Hill River on both sides of the boundary separating Section 35 T15S R8W and Section 2 T16S R8W (Lee and Raynesford 1980:60-61) (this is approximately the location of Localities 5 and 6). Exactly how he came to this conclusion, however, was not published.

Up to this point, historical document research conducted by previous investigators and also by the author preceding the 1995 field season, failed to produce indisputable evidence for the precise location of the fort. Historic maps provided conflicting evidence; one map suggested that the fort was located in the approximate location of present-day Locality 5 and Locality C while another map suggested it to be a 1/2 mile to the northwest of the first in a location where no archaeological features had ever been reported. Regardless of the information shown on these maps, we felt that Locality 6's location and surviving surface features --numerous dugouts situated near the military road and river crossings--made it a prime candidate for the site of Fort Ellsworth. Accordingly, the following research questions were formulated for the 1995 field season: (1) Is there archaeological evidence that the surface depressions in the riverbank were indeed dugouts?; (2) Is there archaeological evidence that a structure once stood on the knoll overlooking the dugouts?; (3) Are 1860s military artifacts associated with these features?; and (4) What is the degree of integrity of these features and deposits?

Archaeological testing in 1995 indicated that artifact collectors had done some damage, but overall integrity of the site was good. Other results were encouraging, too. Excavated building materials and hardware provided indirect evidence of structures. Moreover, unlike the other 14EW26 localities previously investigated, definite Civil War era military items were present. With these results in hand, and the presumption that this was the fort site, research questions were developed to guide further research. These questions are presented in the following section exactly as they appeared in the Data Recovery Plan prepared before the 1996 fieldwork (Ziegler 1996).

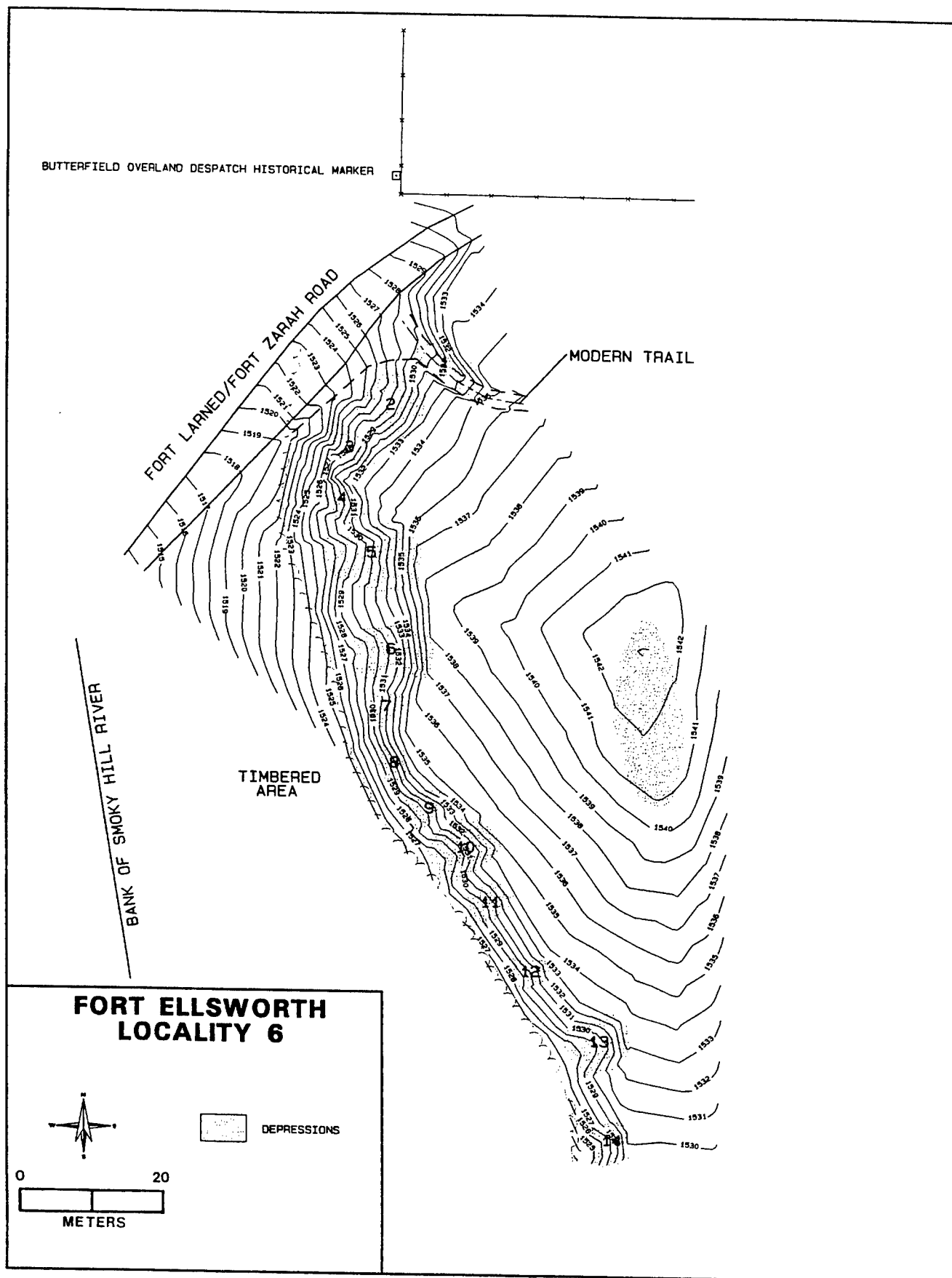


Figure 1.3. Contour map (1 ft. interval) of Locality 6.

Research Domains and Questions

The proposed research will focus on the **reconstruction of past lifeways**, one of several general problem domains identified in the Kansas Preservation Plan (1989). Research questions under this problem domain focus on the reconstruction of lifeways or lifeway details that are not sufficiently recorded in the documentary record. To address the research questions, both archeological and historical data will be utilized, as both are viewed as essential to the understanding of the historical past.

Within the general research goal of reconstructing past lifeways, three specific research domains are addressed in the research: (1) Site structure; (2) subsistence; and (3) material culture. **Site structure** refers to the built environment of Fort Ellsworth, including the types of structures present, their building materials, their condition, and their distribution over the landscape. **Subsistence** refers to the types of foods consumed at the fort. **Material culture** refers to the artifacts used by the fort's inhabitants to cope with their physical and social environment.

Very little is known regarding past lifeways at Fort Ellsworth, and the research questions that follow are directed toward a better understanding of lifeways at that particular site. Beyond that, Fort Ellsworth represents the earliest stage of the development of Fort Harker, and research data will be useful to researchers studying the history and archeology of Fort Harker. Moreover, future studies could explore differences in the artifact assemblages from the two sites.

Another reason to study Fort Ellsworth is that we know very little about the earliest structures at Kansas forts. Many of the permanent forts in Kansas went through several stages of construction, with the earliest structures most often being tents, dugouts, sod, or adobe buildings (Kansas Preservation Plan 1987:24). Dugouts, in particular, were constructed at Fort Wallace (Brown 1986:197), Fort Zarah (Oliva 1982:18), Fort Larned (Oliva 1982:11-12), Fort Dodge (Brown 1986:48), and Fort Aubrey (Kansas Preservation Plan 1987:27). Dugouts have been excavated only at Fort Larned and Fort Zarah; the National Park Service's investigations at Fort Larned are detailed in Scott (1975:64-70), but no report has ever been written on the Fort Zarah work undertaken by the Apache Chapter of the Kansas Anthropological Association in the 1970s (Kansas Preservation Plan 1989:35-36). Research focused on the dugouts at Fort Ellsworth will add to the understanding of this early type of fort structure.

Site Structure

General Winfield Scott, commenting on the condition of U.S. Army frontier forts in 1857, declared "the troops are... either in tents or such miserable bush and mud huts as they have hastily constructed for the moment" (Scott in Utley 1981:37). Nearly a decade later, a similar concern was raised by General William T. Sherman, when he reported that the officers and troops at Fort Sedgewick, Colorado in 1866 lived in dugouts that were such hovels that they would not have been used for slave quarters in the prewar South (Knight 1978:114). Living conditions at frontier forts had not improved much in the eight years that followed, because in 1874 General Sherman said that "Some of what are called military posts are mere collections of

huts made of logs, adobes, or mere holes in the ground, and are about as much forts as prairie dog villages might be forts" (Sherman in Utley 1984:82).

The generals were not exaggerating. At newly established Army forts scattered throughout the West in the third quarter of the 19th century, troops constructed facilities and quarters with whatever materials were at hand. Usually this meant that officers and enlisted men lived in hastily constructed dugouts, log, sod, or adobe structures, or tents, or some combination of all (Rickey 1963:89; Utley 1984:81-82; Knight 1978:112-113). Often, after periods ranging from several months to several years, these crudely-constructed forts were no longer needed and the Army abandoned them. However, not all were abandoned. Some matured, were enlarged, and the temporary facilities and quarters gave way to permanent structures of brick, stone, and milled lumber (Rickey 1963:95; Kansas Preservation Plan 1987:23-24).

Fort Ellsworth appears to have been one of the "miserable" frontier forts described by Generals Scott and Sherman. Clearly a temporary fort, it was abandoned in June 1867, just three years after its establishment. Based on contemporary accounts, temporary dugouts and log structures, made from locally available materials, appear to have dominated the landscape at Fort Ellsworth. Descriptions of permanent frame or stone buildings are conspicuously absent from the accounts. The questions that follow are directed toward a better understanding of the built environment at Fort Ellsworth.

1. What types of buildings were constructed at Fort Ellsworth? Is there evidence of fences, a stockade, or sanitary facilities? What building materials were used?
2. Were the dugouts crude, hastily improvised structures as described in written accounts? Is there any evidence of a pattern of uniformity in the design and construction of the dugouts?
3. What was the layout of the fort? To what extent did natural and cultural factors (e.g., streams, topography, roads, and defense) figure into the selection of locations for fort buildings and other structures?

Subsistence

The principle articles of the ration for soldiers at frontier military posts were pork, bacon, beef, flour, beans and other articles of farm produce, purchased by the commissary department as near the points of consumption as possible (Welty 1938:161). Fixed by army regulation, the established daily ration for one person was:

Twelve ounces of pork or bacon, or canned beef (fresh or corned), or one pound and four ounces of fresh beef, or twenty ounces of salt beef; eighteen ounces of soft bread or flour, or sixteen ounces of hard bread, or one pound and four ounces of corn meal; and to have, every one hundred rations, fifteen pounds of peas or beans, or ten pounds of rice or hominy; ten pounds of green coffee, or eight of roasted (or roasted and ground) coffee, or two pounds of tea; fifteen pounds of sugar, four quarts of vinegar; four pounds of soap; four

pounds of salt; four ounces of pepper; one pound and eight ounces of adamantine or star candles; and to troops in the field, when necessary, four pounds of yeast powder to one hundred rations of flour (Custer in Welty; 1938:161).

At frontier outposts, the mainstays of the common ration were likely to be salt pork, beans, hard bread, and coffee (Welty 1938:161; Rickey 1963:118). However, soldiers supplemented their diet by hunting buffalo, deer, elk, antelope, grouse, pheasant, and wild turkey. Fishing was a favorite pastime that also enriched the menu (Utley 1984:86). Other natural foods, besides game and fish, were used. Wild garlic and lamb's quarter were gathered (Rickey 1969:120), and in the spring, soldiers collected wild onions (Utley 1984:87). Officers' families often kept chickens, pigs, and occasionally milk cows (Caperton and Fry 1980:32). Finally, most posts attempted to cultivate vegetable gardens, but more often than not, the weather and insects wrought disaster (Utley 1984:86).

Soldiers spent their own money to buy extra food from the post trader, or sutler, as he was known then. A surviving post trader's list from Fort Larned, Kansas, illustrates a wide variety of available foods. Examples of food and drink included potatoes, apples, flour, canned tomatoes, canned peaches, canned oysters, eggs, catsup, chocolate, coffee, tea, beer, and whiskey (Oliva 1982:58). Beginning in 1866, Congress permitted the commissary department to supply, at cost, canned fruits, canned butter, onions, potatoes, oysters, pickles, spices, and other small stores. Post traders complained about this practice because they believed it placed the commissary department in direct and unfair competition with them (Rickey 1963:118; Caperton and Fry 1980:31).

Food was often of poor quality because it had to be transported by wagon over vast distances, and it was sometimes spoiled due to improper storage and the length of time in transit. Sometimes the salt pork was rancid, and the flour had worms in it. Hardtack supplied to the troops may have been left over from the Civil War (Oliva 1980:45, 1982:63). Once in storage at the fort, rations were subject to attack from rodents and insects, and subject to spoilage from improper packaging and poor methods of preservation (Caperton and Fry 1980:28).

Little is known regarding the composition of the diet or the quality of the food supplied to the troops at Fort Ellsworth because few historical sources discuss foods. The following questions focus on various aspects of food procurement, consumption, processing, and disposal.

1. What was the composition and quality of the diet?
2. Was the diet representative of the standard issue military rations supplied by the Army's Commissary Department?
3. Were some foods and beverages likely to have been procured from the post-trader or local sources?

4. To what extent did hunting, fishing, or the collecting of wild plant foods supplement the diet?
5. Were animals butchered or otherwise processed on-site?
6. Where was food cooked on-site? Are there discrete discard areas for food remains?

Material Culture

At frontier military posts, the purchase of all military supplies, except commissary and ordnance stores, was the responsibility of the quartermaster department. These supplies included clothing, camp equipage, fuel, horses, forage, wagons, horse equipments, tools, and many other articles (Welty 1938:166). Stockpiles of Civil War surplus weapons, uniforms, and equipment were issued to regular army soldiers even after the approval of new uniforms and weapons in the early 1870s (Rickey 1963:123; Utley 1984:68).

Sutlers provided a great variety of nonfood goods. At Fort Larned in 1863, the Sutler sold castor oil, cologne, blue jeans, canvas, blankets, chewing tobacco, soap, playing cards, diaper pins, neckties, candles, wash boards, hoop skirts, lead pencils, smoking pipes, songbooks, fishhooks, coffee pots, guitar strings, saddles, lanterns, Epsom salt, cloth, pots and pans, hats, matches, needles and thread, nails, revolvers, buttons, sulfur, hair dye, turpentine, wallets, tin buckets, axes, padlocks, scissors, mirrors, beads, and horse liniment (Oliva 1982:58).

Currently, much regarding the material life at Fort Ellsworth remains unknown. The first two research domains dealt with the built environment and diet. The following questions are directed toward a better understanding of other basic needs.

1. Were the troops well supplied? What types of military clothing, accouterments, and equipment were supplied to the troops? What types of civilian goods were available at the fort?
2. What types of firearms were supplied to the troops? Did innovations in firearms and ammunition reach the post rapidly?
3. What was the state of health care and sanitation? Was there a post surgeon (i.e., doctor)? What kinds of medical supplies were available? Was trash disposal regulated?

Methods

This section describes the methods used in the background and historical research, metal-detector surveys, archaeological excavations, and artifact processing. Methods utilized in specialized investigations or analyses of recovered data are fully described in subsequent chapters and appendices.

Background and Historical Research

Background research began with the examination of historic artifact collections from 14EW26 curated in the Ellsworth County Historical Society and the University of Kansas. Also examined was the collection of Mr. Lyle Harrell, who lives on the property just to the northeast of Locality 6. Another local resident interviewed was Lloyd Grothusen, who owns land on the west bank of Spring Creek. In 1996, Mr. Grothusen escorted the writer and Jim Gray around his property and shared his knowledge of the land. James Podlina, another local resident who has collected military artifacts from the Fort Ellsworth/Fort Harker vicinity, was also interviewed.

The author also completed a review of published and unpublished sources housed at the KCD office, the Kansas City Public Library, the Johnson County Public Library, the Frontier Army Museum Library at Fort Leavenworth, and the Kansas City Branch of the National Archives. At the National Archives in Washington, D.C., searches for maps and other relevant documents were conducted by National Archives staff, and archeologist Richard Fox, Jr., of the University of South Dakota.

In the spring of 1996, historian Cynthia Baer of American Resources Group, Ltd. conducted an extensive historical study (Chapter 2). Her work commenced with a search through bibliographies, archival directories, and historical indexes and references to locate primary and secondary sources that may be pertinent to Fort Ellsworth. A review of the previous archeological and historical studies of Kanopolis Lake, the archeological data recovery plan prepared by the KCD (Ziegler 1996), and other pertinent secondary sources was completed prior to research. An example of a pertinent source that was reviewed is the U.S. War Department's 129-volume publication titled *War of the Rebellion: A Compilation of the Official Records of the Union and Confederate Armies* (1880-1901). Phone calls and Follow-up letters were made to various archives that contain significant military history or western history collections. For example, the U.S. Military History Institute at Carlisle Barracks, Pennsylvania, was contacted regarding their collections and possible reference sources. Then research into primary and secondary sources was completed at the Kansas State Historical Society, the Salina Public Library, the Ellsworth County Historical Society, and the Fort Harker Museum. Records that were examined at these sites includes the papers of Joseph Lehman and Daniel H. Page, the papers of Allen Ellsworth, the journal of the post sutler at Fort Harker, the papers of Julian Fitch, the *Ellsworth Messenger*, the *Ellsworth Reporter*, the Morrison family collection, and the Robert Muir papers. Cynthia also visited the site of Fort Ellsworth when fieldwork was in progress in 1996.

Cynthia also completed a trip to the National Archives at the Washington, D.C., location and at College Park, Maryland. Examples of record groups that were searched include those of the Department of the Missouri, Department of Kansas, Office of the Surgeon General, Office of the Inspector General, Office of the Chief of Ordnance, Office of the Quartermaster General, Bureau of Indian Affairs, Adjutant General's Office, U.S. Army Continental Commands, Office of the Chief of Engineers, Regular Mobile Army Units, and Bureau of Land Management.

Metal-Detector Surveys

In 1995, a preliminary survey was conducted over a small area of Locality 6 with the limited KCD equipment available to the research team: a Tesoro Bandito metal-detector with "all-metal" mode and a Schonstedt magnetic locator designed to detect only ferrous metals. The 1995 survey was successful in locating surface and near-surface fort-related artifacts, consequently in 1996 a much larger area of Locality 6 was surveyed by a crew of six-to-eight operators with varying degrees of experience, each using his personally-owned machine. Before each survey, the prairie grass was mowed to a height of approximately 3-6 in.

Methods for both surveys were essentially the same; operators lined up side-by-side and walked over a designated survey area in parallel transects, slowly and systematically moving the detectors from side-to-side (distances between operators of about 6-7 m were employed on flat and gently sloping areas; distances of 2-3 m were employed within and adjacent to the 14 dugout features). When the machine indicated a target, the operator inserted a pin flag into the ground to mark its location. After the survey area was covered, each target was more fully investigated by pulling the flag and carefully sweeping the metal-detector over the target area to pinpoint the exact location of the artifact. A small hole was dug to expose the artifact, then its depth was measured and its location was mapped in. Finally, the artifact was removed and placed in a bag labeled with a unique field number, the provenience information, and the identification as to the type of artifact. Then this same information was recorded on a form as well.

All recovered artifacts were mapped in with a land surveyor's transit in 1995 and a Sokkia EDM total station in 1996. These data were then transferred to a computerized mapping program to produce distribution maps.

Archaeological Excavations

Prior to the 1995 test excavations, a professional land survey crew from the KCD established two site datums, each consisting of a permanent aluminum and steel marker set into the ground. Each marker was tied into a nearby existing permanent concrete monument that marks the trail of the Butterfield Overland Despatch.

Field methods for the 1995 and 1996 seasons were essentially the same, with one exception. In 1995, it was decided that the English-based system of measurement would be used because that is the system under which the fort was constructed. The basic excavation unit was a 5 x 5 ft. square, excavated in arbitrary 6 in. levels or cultural strata if they could be discerned. A standard surveyor's transit was used to record vertical measurements. A change was made to the metric system in 1996 because the English-based system used, with measurements in tenths of a foot, was confusing to excavators and supervisory archeologists alike. The metric system also fit with the practices of the Kansas Archeological Training Program. In 1996, the basic excavation unit was a 2 x 2 m square, excavated in arbitrary 10 or 20 cm levels or cultural strata if they could be discerned.

All excavation work in 1995 and 1996 was conducted by hand, using shovels, trowels, and other appropriate small tools. Excavated soil was passed through 1/4 in. mesh hardware cloth. Excavators or supervisors filled out a standard form for each unit or feature level. This form was used to record basic information including site number, unit number, level, depth, name of excavator, samples taken, soil conditions, types of artifacts present, disturbances, relevant personal observations, photographs taken, and the date. A separate form was used for piece-plots of individual artifacts or special samples. Cultural features were denoted on a longer form to record location, observations on size and depth, and contents. Recovered artifacts were placed in paper bags labeled with the site number, provenience information (unit/feature/level), date, and name of the excavator. Bagged material was transmitted to the field laboratory each afternoon for processing.

Pit features were cored with an Oakfield corer prior to excavation to recover information regarding the depth and complexity of the fill. Then the feature was drawn in plan-view, photographed, and excavated in cross-section. A detailed profile of the remaining half was then drawn, photographed in B&W and color, and excavated.

Potential post molds were excavated in cross-section prior to assignment of feature numbers in order to verify that they in fact postmolds and not rodent runs. Once verified, a feature number was assigned, plan and profile views were drawn, and the feature was photographed. Then the remaining portion of the feature was excavated.

Samples of feature fill and from a number of "control" excavation levels were recovered for flotation. The minimum sample size was two liters. Once samples were floated, light and heavy fractions were allowed to dry. Dry samples were bagged, labeled, and stored until they could be sorted into raw material classes (glass, metal, ceramics, bone, etc.) and botanical remains.

A clearly identifiable cultural layer constituted the floor of each dugout. Consequently, all adjacent units were first excavated to this floor-level, then excavation proceeded until the sterile subsoil was reached. All identifiable structural features of the dugout were mapped and photographed in color and B&W.

Artifact Processing, Cataloging, and Curation

The relatively small artifact collection recovered during the 1995 testing of the site was cleaned, air dried, and rebagged in Kansas City by the writer. Sorting and cataloging of the 1995 collection was accomplished at the field laboratory facility located in the town of Kanopolis during the 1996 field season. Methods used to sort and catalog the 1995 collection were the same as those employed for the 1996 collection as described below.

Artifacts were processed in the field laboratory in Kanopolis. An experienced laboratory supervisor oversaw the daily processing of artifacts. In the laboratory, a provenience code was assigned to each bag of artifacts from each level or feature. A list of all provenience codes assigned to bags of artifacts from the site and a bag list which records all of the information from each sack and the provenience code for that sack was made before the processing of materials

began. Artifacts were cleaned by whatever method is appropriate to the material: tap water for durable items, dry brushing for metal, and careful cleaning with a dry soft brush for fragile objects. Artifacts, as well as wood and soil samples, were placed with field bags on screen drying racks to air dry.

Once dry, the artifacts were sorted and then placed in plastic bags with tags identifying the proper provenience information. High frequency items, such as nails or unidentifiable metal fragments, were bulk bagged. Potentially diagnostic items (bullets, cartridge cases, buttons, coins, whole bottles, or sherds containing maker's marks or labeling) were individually bagged.

Next, artifacts were catalogued. The catalog number consists of the site number, provenience code number, with a third unique identifying number added in the case of potentially diagnostic items. High frequency items were bulk catalogued. Paper catalog sheets provided spaces for provenience information and artifact descriptions. Data recorded were site number, area, excavation unit, feature number, level number, depth, and provenience code. Artifact-specific information included specimen number, item count, weight, material, function, type, subtype (object), portion, length/ height, width/diameter, thickness/depth, color, decoration, and comments.

Once recovered materials were cataloged, analysis proceeded. Analytical procedures are detailed below in each of the separate analyses of recovered materials (Chapter 4, artifacts; Chapter 5, faunal remains; Chapter 6, botanical remains). All artifacts and all records associated with this project are permanently curated at the Kansas State Historical Society, Topeka.

The Prehistoric Component

The research reported in this volume focused on a better understanding of the historic military occupation of the site, but soldiers clearly were not the first to occupy it. Previous researchers identified the presence of prehistoric lithic and ceramic artifacts at several localities (Smith 1949; Leaf 1976, 1977; Lees and Schockley 1987), and in the 1995-1996 excavations a small collection of prehistoric lithics and ceramics was recovered at Locality 6. Nearly 100% of these items came from the highest portion of Locality 6, the knoll, where the intermixing of prehistoric and historic deposits in the upper excavation levels indicates that soldiers, in the construction of fort buildings or other facilities, dug into the prehistoric occupation (see Chapter 3). Richard A. Fox (Appendix B) describes the 1995-1996 prehistoric collection in this report; based upon ceramics he places the prehistoric occupation within the Smoky Hill (AD 1000-1300) or Upper Republican (AD 1100-1400) Phases.

CHAPTER 2

HISTORICAL CONTEXT

by
Cynthia L. Baer

Saline River, Kansas, September 1, 1866

We left Fort Ellsworth this morning. With the exception of General Palmer, commanding, there appeared to be no officers present. Absent, probably, on detached service. Falling asleep last night while listening to the barks and yelps of the coyote, or prairie-wolf, and dreaming of running a pack of them on the prairie, we are suddenly and pleasantly awakened by a swell and burst of rich harmony on the night air. As we become conscious it is music, the joyous song of the merry "Barber of Seville" awakens the echoes of the hills:

"Bravo, bravissimo, Figaro, bravo!"

Tutti me chiedono,

Tutti me vogliono,

Son barbiere di qualita,

Tra la, la, la, la, la, la!"

It was the band of the Second Cavalry serenading our General. Then came familiar airs that told us of those we love at home. And so I fell asleep and dreamed I was there (Meline 1966:297-298).

Introduction

Established in 1864 as one of a string of forts along the Smoky Hill/Denver Express Road, Fort Ellsworth provides a compelling study of a small slice of Kansas history. The fort was specifically situated at the junction of the Smoky Hill/Denver Express Road and the Fort Riley/Fort Larned Road, otherwise known as the Smoky Hill Crossing (Figure 2.1). These roads led to points both west and southwest. From 1864 to 1866, troops garrisoned at Fort Ellsworth provided assistance and protection to the outlying settlements along the roads and to the many government and civilian caravans passing by.

The Smoky Hills During the 1850s and Early 1860s

One of the earliest Indian groups known to have inhabited the Smoky Hills region was the Kansa. This tribe was noted by the French as early as the late 1600s. In 1702 the tribe was said to consist of 1,500 people. Although French settlement took place primarily along the Mississippi River, they did launch exploratory missions west into Missouri and Kansas in hopes of widening their trade network. The first fort in Kansas was built in 1744 near a Kansa village located in the vicinity of present-day Fort Leavenworth. This fort was called Fort Cavagnial. French control of

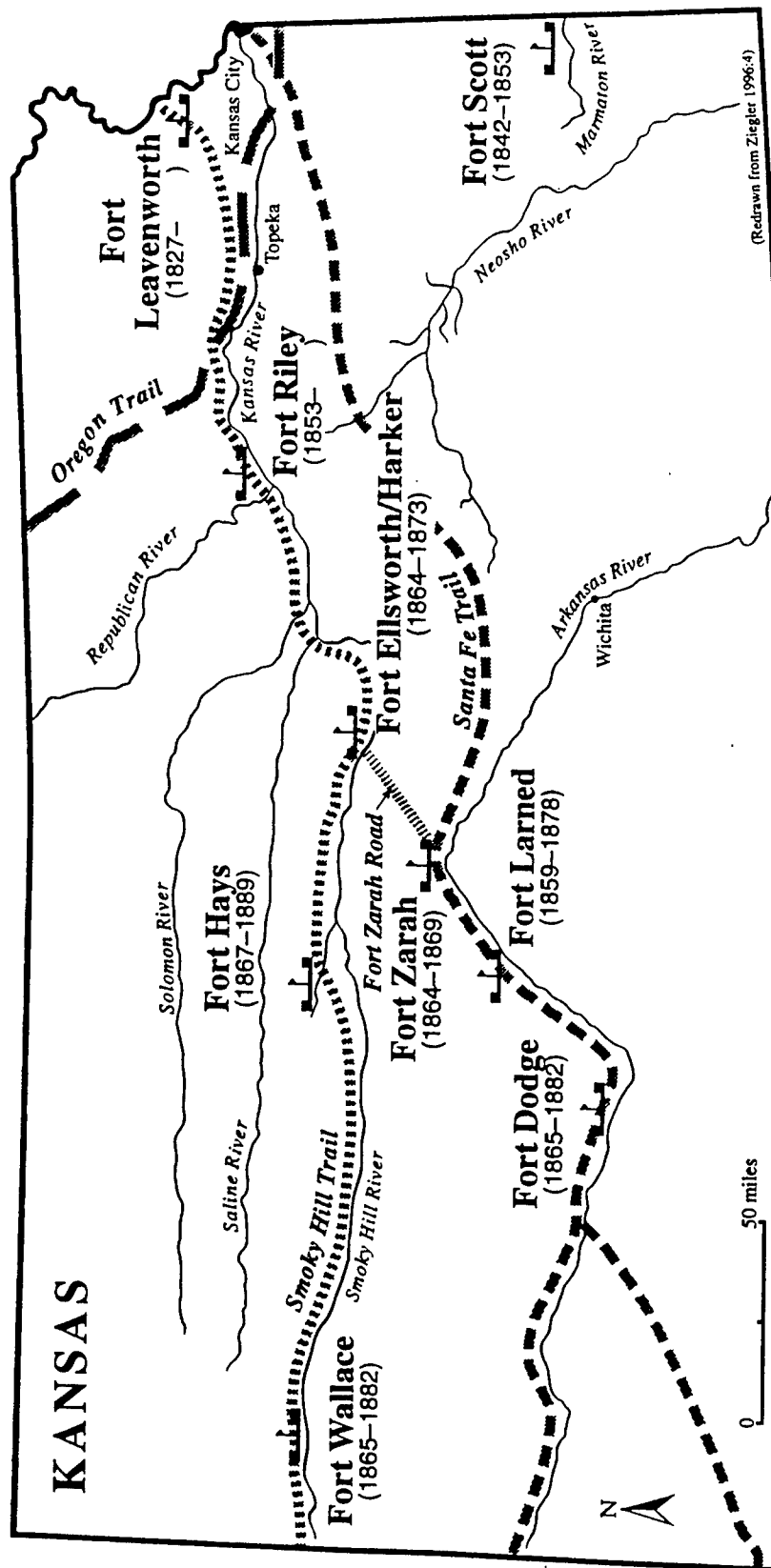


Figure 2.1. Major trails and forts in Kansas during the 19th century (after Ziegler 1996:4).

the region lasted until 1763, when Spain gained title to the region as a compensation for losses incurred during the French and Indian War. After Spain retroceded the region back to France in 1801, America purchased the region from France in 1803. One of the first expeditions into the new American territory was undertaken by Meriwether Lewis and William Clark in 1804. They crossed the northeastern corner of Kansas during their explorations. In 1806 Captain Zebulon Montgomery Pike transversed the region, and he was the first to use the term "Smoky Hill" to describe the region in a published report (Barr et al. 1977:13-16; Kansas Preservation Plan 1987:21; Mattes 1947:7).

In 1821 Mexico gained its independence from Spain, and trade networks between Mexico and America were established. America quickly became concerned with protecting the valuable caravans traveling to and from Santa Fe. In 1827 Colonel Henry Leavenworth was directed to select a site for a cantonment on the Missouri River to serve the military charged with policing the road. Cantonment Leavenworth was renamed Fort Leavenworth in 1834, when it became a permanent post. The post quickly became a starting point for explorers and pioneers preparing to travel on the Santa Fe Trail, as well as a starting point for California, Oregon, and the Colorado gold mines (Barr et al. 1977:17; Kansas Preservation Plan 1987:21).

One of the trails that started from Fort Leavenworth was the Smoky Hill Trail. This trail was originally an Indian trail following the Smoky Hill River to its source. The winding trail was not heavily used by white travelers, however, until the rush for Colorado gold in 1859. The following year a shorter and straighter route was laid from Fort Leavenworth to Denver. This trail provided a more direct route to Pike's Peak than either the Santa Fe Trail or the Platte route. This road was used by the various stage companies until the coming of the railroad in the late 1860s. The trail was still dangerous, however, as the area was heavily populated by Indians and there was a scarcity of wood for fuel along the route (Lee and Raynesford 1980:34-45; Mattes 1947:15; Wilson 1979:2).

One of the first well-documented explorations of the Smoky Hill River area was by Captain John C. Fremont. On the return from an expedition to California in July of 1844, Fremont descended the fork of the Smoky Hill River. He followed the river below the site of the future Fort Ellsworth to cross over the Santa Fe Road. During his trip he encountered Pawnee Indians and narrowly escaped attack. Other Indian tribes living in this region at this time included the Kiowa and Comanche (Lee and Raynesford 1980:11-13).

Due to the increasing number of Indian thefts of livestock and goods from wagon trains, additional military posts were established along the major rivers and trails running through Kansas. In 1853, one year before the Territory of Kansas was created, Fort Riley was established at the junction of the Republican and Smoky Hill rivers. Another fort, Fort Larned, was established in 1859 at the Pawnee Fork of the Arkansas River. These forts provided escorts and safe lodging for the many wagon trains of settlers and merchants proceeding to the west. The forts were primarily supplied by Fort Leavenworth. Fort Larned also served as a headquarters for Indian agents (Kansas Preservation Plan 1987:22; Mattes 1947:8).

During the 1850s, several exploratory trips were commenced up the Smoky Hill River valley. Explorers included Captin J. Pope in 1851, Captain J. W. Gunnison in 1853, and Lieutenant F. T. Bryan in 1855. Bryan was conducting a survey for a road connecting Fort Riley with the Santa Fe Trail. His route followed the Kansas River and the Pawnee Fork of the Arkansas River to a point above the Cimarron Crossing, then to Bent's New Fort in the Big Timbers. When he returned to Fort Riley, Bryan reported that a good wagon trail existed, but suggested that a heavy train be driven over it to further demarcate it. This road became variously known as the Santa Fe Road, the Fort Riley Road, and the Fort Larned Road. After the construction of Fort Zarah in 1864 at the junction of the road and the Santa Fe Trail, it became known as the Fort Zarah Road (Goetzman 1959:368-369; Lees and Shockley 1986:145; Mattes 1947:7).

Another recommendation made by Bryan in 1855 was to construct three bridges along the road. The bridges were to cross the Solomon's Fork, the Saline, and the Smoky Hill Fork. In 1856 James A. Sawyer, a civilian contractor, was hired to construct the bridges. He was accompanied by an escort of Army dragoons to provide protection against raiding Cheyennes. It is stated that the construction party used a portable steam sawmill to build the bridges. Bryan's assistant, Coote Lombard, stated that "The bridging of this road has induced settlers to move out at least forty miles beyond the heretofore bounds of civilization, i.e. at and beyond the Saline Bridge. I expect that there will be settlers at the Kaw [Smoky Hill] River Bridge, eighty-five miles west of Fort Riley by next spring---the opening of this road has pushed the settlements beyond where they would be if the road had not been opened" (Quoted in Goetzmann 1959:369). The government bridge at the Smoky Hill Crossing, future site of Fort Ellsworth, was supposedly swept away by a flood in 1858 (Shoaf 1938:6). It is not known whether the bridge was rebuilt or not, although it is known that a ford across the river was in use a short distance below the bridge site (Figure 2.2). Notes made by U.S. Surveyors in 1866 refer to the location at 1.5 chains west along the boundary of Section 35, T15S, R8W, as the "old bridge site," which leads one to believe that either a new bridge was built in another location or the bridge was not replaced at all (Mattes 1947:9). After 1858 Congress did not grant any further appropriations for military roads in Kansas (Goetzmann 1959:370).

Coote Lombard's prediction of settlements extending to the Smoky Hill River bridge held true. Settlement was encouraged in Kansas with the publication of two books. *Kansas and Nebraska*, published by Edward E. Hale in Boston in 1854, was the first book to be published that described the region. Another book, *The Kansas Region*, published by Max Green in 1859, gave "glowing accounts of the Smoky Hill Valley" (Mattes 1947:8). In 1860 the first group of settlers arrived in the vicinity of the Smoky Hill River bridge. At the forefront was P. M. "Smoky Hill" Thompson. Thompson was originally from New Jersey, and he quickly established a claim along the creek which bears his name today. Other settlers included Henry and Irwin Farris, Adam Weadle, and S. D. Walker, all of whom arrived later in 1860 and located on Clear Creek. Two men, Joseph Lehman and Daniel H. Page, established a claim along the Smoky Hill River at the future site of Fort Ellsworth on the Fort Riley Road (Andreas 1883:1274; Shoaf 1938:6; Mead 1986:59-60, 98).

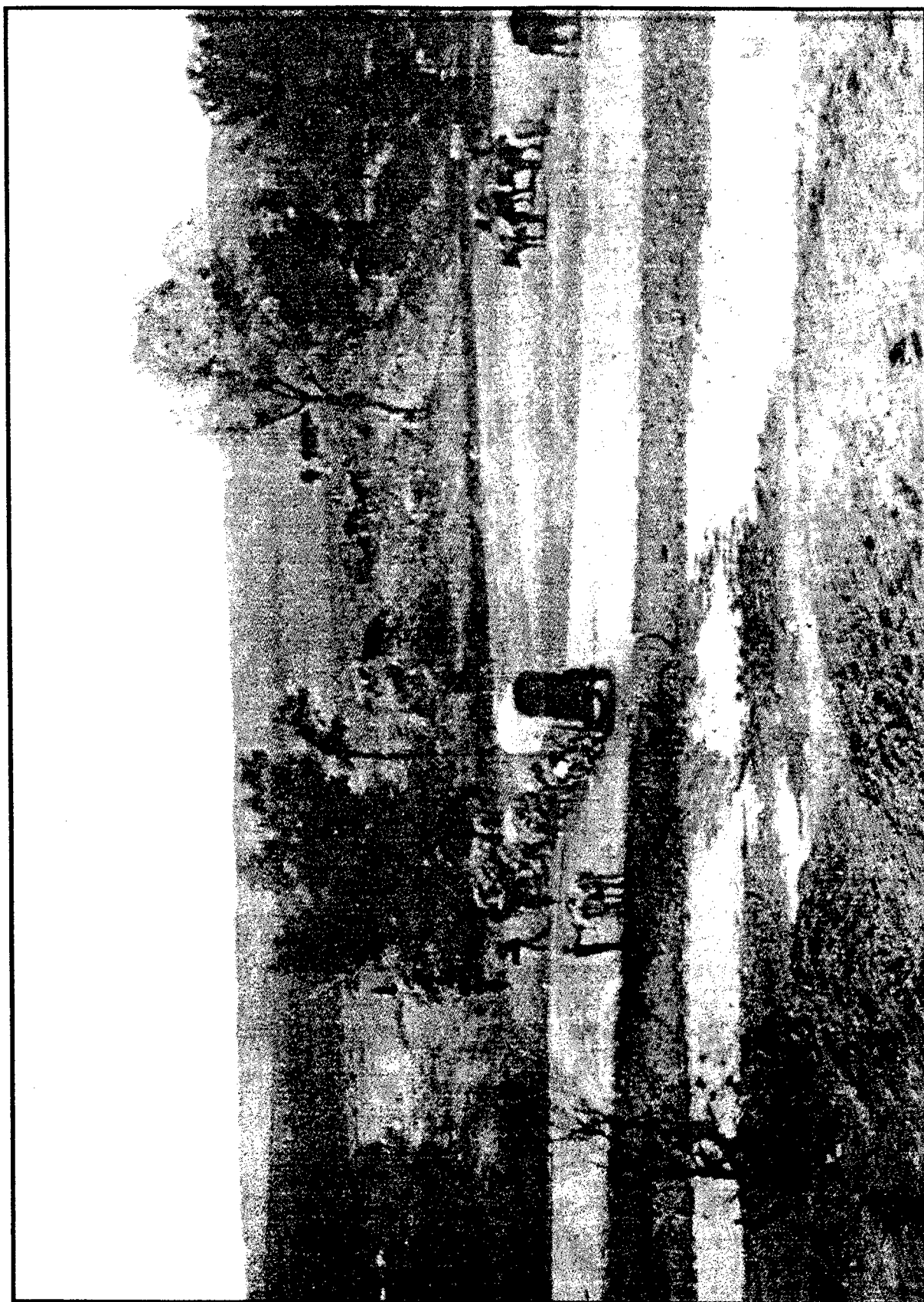


Figure 2.2. Gardner photograph of bull train crossing Smoky Hill River, Ellsworth County, 1867. (Courtesy of Kansas State Historical Society.)

Joseph Lehman was born in Buffalo, New York, in January of 1846 (Figure 2.3). Nothing is known about his parents, and he left home at an early age. Lehman met Daniel H. Page in 1858 at Westport Landing, Missouri. Page and Lehman visited New Mexico and Arizona before returning to Kansas in 1859 or 1860. They established their claim on the Smoky Hill River in 1860 and remained there until May of 1864. Lehman married Sarah Jane Combs on November 27, 1864. They remained in Saline County until 1867, when they moved to McPherson County, Kansas. Sarah died in 1878, leaving four children. After her death, Joseph moved with his children to Gunnison, Colorado. He died there in 1890 (Vassar 1988:195-197; Campbell 1928a). Daniel Hussey Page was the son of Benjamin Page and Hulda Hussey (Figure 2.4). He was born on 13 April 1834 in New Hampshire. After attending both Phillips Exeter Academy and Bowdoin College, he worked as a tutor until traveling to Kansas in 1858. After moving from the ranch to Salina in 1864, Page enlisted with the volunteer militia assembled at Salina. Page married Margret Jane (Maggie) Combs, Sarah's sister, in 1866. They moved to McPherson County, Kansas, shortly thereafter. They had 11 children, and later moved on to Higgins, Texas, during the 1880s. Page died in Texas in 1906 (Vassar 1988:199-201; Campbell 1928b).

Land records indicate that Joseph Lehman purchased from the United States government the land located on the north side of Spring Creek in Sections 35 and 36, T15S, R8W (Lees and Shockley 1986:127). Three buildings and a large field were recorded at this location on a map drawn by the General Land Office in 1862. The structures were labeled "U.S. Mail Station" (Figure 2.5). The structures have been described as a two-story log house and some outbuildings (Lyon 1879:25). The survey notes of the General Land Office state that at approximately 396 feet north along the line separating Sections 35 and 36 was "Joseph Lemon's [*sic*] house, a U.S. Mail Station, 4.00 chains [264 feet] West of line," which places it east of the Smoky Hill River. Sixty-six feet further north the survey line crossed "A road to Pawnee fork bears S. 70[degrees] East and West" (Campbell 1928a; King 1996:2).

The primary occupation of Lehman and Page was hunting. The land provided a more than ample supply of buffalo, wild turkey, and other game. Lehman and Page were described by a traveler as young men who lived "by killing buffalo for their pelts and tallow, and by killing wolves for their pelts." A living could be made off of the killing of buffalo at that time. Dried buffalo hides sold for five cents a pound in Leavenworth (Choitz 1967:4; Mattes 1947:10). Lehman and Page also engaged in farming, planting corn and wheat on the river bottom (Lyon 1879:26; Miner 1986:41; Campbell 1928a). Farming on the Kansas frontier for Page and Lehman was rough. A drought hit the area from 1859 to 1860, and grasshoppers periodically ravaged fragile corn fields as well (Wilson 1979:2).

The location of the Page and Lehman ranch along the Fort Riley/Fort Larned road provided an ideal situation for the establishment of a store, because the road was frequently used by both the military and civilians. Items they kept on hand included whiskey, molasses, clothing, tobacco, medicine, sewing supplies, flour, mall rings, plows, postage stamps, log chains, and ely caps. They grew their own produce, which they sold in the store. Produce included corn, onions, radishes, cabbage, potatoes, sweet corn, and beans. The winter months were spent hunting and

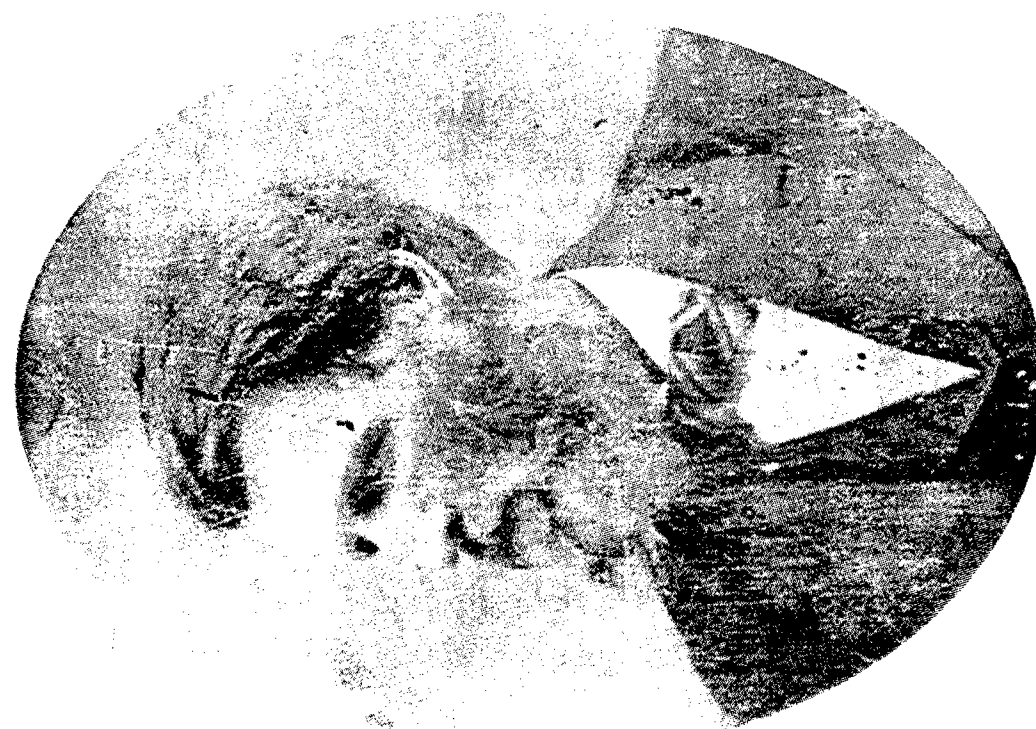


Figure 2.3. Photograph of Joseph Lehman. (Courtesy of Salina Public Library, Cambell Room of Kansas Research.)



Figure 2.4. Photograph of Daniel H. Page. (Courtesy of Salina Public Library, Campbell Room of Kansas Research.)

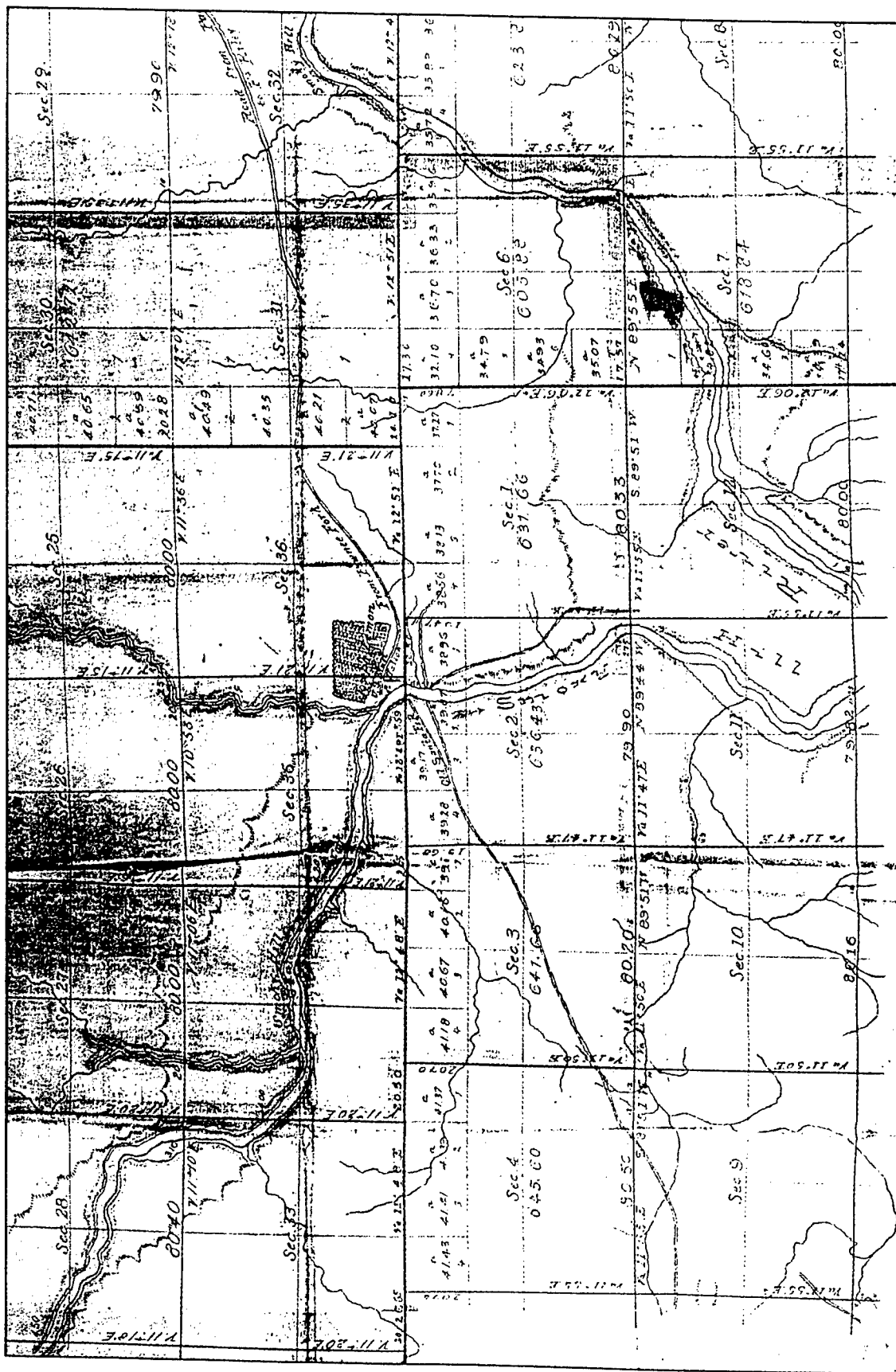


Figure 2.5. Detail of map showing location of Page and Lehman ranch. Map by General Land Office, T15S, R7 and 8W, and T16S, R7 and 8W, 1862. (Courtesy of National Archive.)

making fences. On one trip in March of 1862 Lehman and his neighbor Farris killed 107 wolves. On another trip in April of 1862 Lehman and Farris killed 61 buffalo. Page spent much of his time during the winter of 1862 constructing fence posts and rails. By mid-April of 1862 he had cut and morticed a total of 546 posts. In addition, weekly stage service was set up between Junction City and Fort Larned during the fall of 1862 by the Kansas Stage Company. The company chose the Page and Lehman ranch in August of 1862 as the only station in the area. The stage was contracted to deliver the mail to the station from Salina, Kansas, the closest town (Andreas 1883:1274; Shoaf 1938:6; Campbell 1928a). Part of Page and Lehman's duties for the stage company included feeding the stage's drivers and passengers and taking care of the stage mules. Usually there were four mules to be fed and watered (Campbell 1928a; Wilson 1979:2).

The Territory of Kansas was created with the passage of the Kansas-Nebraska Act in 1854. This act both opened the area for settlement and left the question of slavery up to the Kansas voters. For ten years, from 1855 to 1865, pro-slave and free-state partisans fought violently in eastern Kansas along the Missouri border. The Governor of the Territory was unable to contain the fighting with militia forces, and federal troops at Fort Leavenworth were ordered to assist them in 1856 (Kansas Preservation Plan 1987:24; Wagner et al. 1993:21-22). Even though Kansas entered into the Union in January of 1861 as a free state, conflict still continued between the two factions. Chief among the skirmishes during the Civil War years was Quantrill's raid in August of 1863. William Quantrill, a pro-slavery guerrilla from Missouri, attacked the city of Lawrence before dawn. The attack left 183 men dead and a significant portion of the city demolished (King 1996:1; Monaghan 1955:281-287). The Page and Lehman ranch was hit by a party of 18 "Bushwackers" or proslavery raiders in September of 1863. Traveling west, the party raided Salina before hitting the ranch of the Faris brothers. The next to be struck was the Page and Lehman ranch. There they seized a pony and double-barrelled shot gun belonging to Page and Lehman, and four mules belonging to the Kansas Stage Company (Choitz 1967:5; Lyon 1879:33; Mead 1986:117-118). In 1864 General Sterling Price of the Confederate forces marched to Kansas City, Missouri, but was defeated in a battle at Westport. He was again defeated south of the town of Trading Post in Linn County on 25 October 1864. That battle involved 25,000 men (Kansas Preservation Plan 1987:69-71).

In addition to the conflicts erupting between Americans over the slavery question, conflicts also erupted between the white settlers and the Indians. In 1834 Kansas was included within a large reservation designated "Indian Country." Despite the fact that various Indian tribes still held titles to Kansas land, the United States organized the Territory of Kansas in 1854 and opened up the land for settlement. Shortly thereafter the cities of Leavenworth, Atchison, Topeka, and Lawrence were founded, and forts began to be built along the trails (Andriot 1980:275). Treaties were eventually reached with the Delaware, Kickapoo, Miami, Shawnee, Piankasha, Wyandot, Kaw, Chippewa, Sac, Fox, Potawatomie, Ottawa, Cherokee, and Osage from 1854 to 1867 (Wagner et al. 1989:33). The remaining tribes, such as the Pawnee, Cheyenne, Sioux, and Comanche, continued to live and hunt within the area, but they became increasingly frustrated as the white settlers began exterminating the buffalo. As a result, they began to strike out at the white settlers on the roads and in isolated settlements (Andriot 1980:275; Kansas Preservation Plan 1987:22; Wagner et al. 1989:33).

On 17 May 1864 the Cheyennes attacked the ranches on the Fort Riley/Fort Larned Road. At a ranch on Cow Creek, S. D. Walker, who tended stock for the Kansas Stage Company, was killed. The other men at the ranch fired back, killed two of them, and wounded another, but the remainder of the Cheyennes escaped. The men fled the ranch and spread the alarm. The settlers congregated at Page and Lehman's ranch, where they set up watch. Although the expected attack did not materialize, the settlers as a group decided that it was unsafe to return to their ranches and they left for Salina. A ranch on Walnut Creek was also approached by the Cheyennes, but due to the owner having a Cheyenne wife, he was only warned to leave or be killed and his wife taken prisoner. The reason the Cheyennes gave for their attack was that they had just fought with Colorado troops, and their chief was killed. In retaliation, they were going to kill all of the white people they could find in the area. Troops from Fort Riley were sent out, and they discovered the body of S. D. Walker and the ranches along the road deserted. At Fort Larned, where the Colorado troops were stationed, a council was held with the Arapahoes, Kiowas, and Comanches who were present at the fort. All of the representatives stated that they were against war, but only the Comanches criticized the Cheyennes for their actions. It was also stated that the Sioux were participating with the Cheyennes, and that they were still within the Smoky Hills and watching the road. It was estimated that the Kansas Stage Company had lost 16 mules during the attacks. Although the Fort Riley troops could find no proof that the ranchmen were selling whiskey to the Indians, it was suspected that some on the Santa Fe Trail and one on the Fort Riley Road had been trading revolvers with them. The attacks resulted in the decision by the United States to step up their security measures along the Smoky Hill/Denver Express and Fort Riley/Fort Larned road by establishing more military forts (Andreas 1883:698, 1274; Shoaf 1938:6; U.S. War Department 1893, 34(4):149-150).

The Founding and Development of Fort Ellsworth

The United States quickly responded to the threat of Indian violence. In June of 1864 Major T. I. McKenny, Inspector-General of the Department of Kansas, led a cavalry troop to the site of the abandoned Page and Lehman ranch at the Smoky Hill Crossing of the Fort Riley/Fort Larned Road. As the Smoky Hill Crossing was thought to be one of the most dangerous and important points along the road, especially since it was expected that the Denver mail would be transferred along that route in the future, McKenny initiated the construction of a blockhouse at the site. He then left it to be completed by 2nd Lieutenant Allen Ellsworth and 40 men of Company H, 7th Iowa Cavalry. Major McKenny's report to the Assistant Adjutant-General of the Department of Kansas stated that:

I proceeded the following morning to erect a block-house from timbers which I found already cut, and which were already hewed on two sides, but it was found necessary to hew the other two sides on account of the crookedness of the logs. On the 13th, having one story of the building up, left it with instructions, in charge of Lieutenant Ellsworth, of the 7th Iowa Cavalry, to finish (U.S. War Department 1893, 34[4]:402-404).

The fortification was one of several built along the Smoky Hill/Denver Express and Fort Riley/Fort Larned roads to help protect settlers, stages, and other travelers from Indian attacks. Fort

Ellsworth was also established "to furnish a point from which operations could be carried on against the Indians, who were very troublesome during the greater part of the rebellion" (King 1996:2).

The fort was named in honor of 2nd Lieutenant Ellsworth at a dress parade at Fort Larned the following July (Figure 2.6). The announcement was made by General S. R. Curtis, Commander of the Department of Kansas. Ellsworth had mustered into Co. H. of the 7th Iowa Cavalry on 13 July 1863 (Ellsworth 1878; Hummel 1938:1).

The only documented structure known to have been built in 1864 was the two-story blockhouse. The materials used in the construction included hewed logs found at the site, which were probably left by Page and Lehman when they deserted the ranch a month earlier. Intended to be only temporary, the fort does not appear to have been improved upon until the following year.

In 1865 many travelers ventured past Fort Ellsworth in wagon trains headed to points west and southwest. From some of the surviving accounts, the changes in the physical structure of the fort can be documented. One such account was left by William Darnell. Darnell was employed as a teamster at Fort Riley. He was in charge of driving supply wagons to the forts that had been established along the Fort Riley/Fort Larned road and the Santa Fe Trail. His first order was to deliver 25 wagons to forts Ellsworth, Zarah, and Dodge. He made note of Fort Ellsworth during his trip.

The most imposing building there at this time was the commissary's building, a sod house about 25 by 40 feet in size, overlooking the Smoky Hill River. The barracks and officer's quarters consisted of dugouts in the bank along the river front. No stockade of any sort surrounded the fort. It was the first and only settlement between Salina and Fort Zarah on the Arkansas River, and was about a one company post (Root 1928:509-510).

Another person who made note of Fort Ellsworth while passing through was John Morrill. Morrill wrote a letter to his wife and children on 23 September 1865 that described some of the structures at the fort.

We are now in camp at Ft E as it is termed but you would smile to see the Ft. there is a groupe [*sic*] of log shanties covered with dirt. most of the windows are made of boards hung on leather hinges & made to swing open & shut. there is two or three of them which have a half window sash & some of them two or mor [*sic*] lights of glass in them. I suppose the aristocracy reside in them which have the glass. it is a military post there are soldiers established here. there is but verry [*sic*] few log shakes perhaps 8 or ten in all & a cat could go in & out of them between the logs. there is a row of caves along the river bank in which the Soldiers burrow in winter (Morrill 1865).



Figure 2.6. Photograph of 2nd Lieutenant Allen Ellsworth. (Courtesy of Kansas State Historical Society.)

Based on the above accounts, more structures were built at Fort Ellsworth since the construction of the blockhouse in 1864. These structures included a 25 by 40 ft. sod commissary building, dugouts along the creek bank for soldiers, and log shanties possibly for the noncommissioned officers and officers. Another description of the dugouts described the placement of them in relation to each other.

Any place a bank existed along Spring Creek or the Smoky Hill River, there were dugouts. One section of Spring Creek where the bank was exceptionally steep, was lined with three tiers of the dwellings. The roof of the lowest provided a "front porch" for the one above, and so on. To a person standing on the parade ground [of new post completed in 1867] looking toward the west, southwest and northwest, the sight of smoke pouring forth from hundreds of chimneys projecting from unseen dwellings was said to have suggested a view of the "infernal regions!" (Mitchell 1987:2).

Unfortunately, few military records from the post and no maps exist for the years 1864 and 1865, thus there is little to document the above descriptions (National Archives [NA] 1865-1869:De Courcy to J. Jacobs, 3 December 1865). However, information on similar structures dating to the same period are available for other Kansas forts. John Morrill also described Fort Zarah and Fort Larned in 1865. He wrote on 26 September 1865 that at Fort Zarah "All most all the building are caves dug in the river Bank & what few there are on top of the ground are covered with earth" (Morrill 1865). At Fort Larned he wrote on 2 October 1865 that the

buildings are mostly built of mud made into large square blocks & dried. then laid into a wall. mud being used for sement [*sic*] or mortar. then they are covered with polls & brush & then covered with dirt. they will answer for dry weather but cannont shed water. There is one of a similar wall covered with Shingles. also one Stone one shingled. There is two made by sitting posts endwise in the ground near together & covering with dirt but the greatest number are made by excibating [*sic*] in the bank & then covering with dirt. These latter are used as quarters for soldiers (Figure 2.7) (Morrill 1865).

By February of 1866 the temporary structures at Fort Ellsworth were beginning to show wear and tear. Commanding Officer John Green of the 2nd U.S. Cavalry reported to Fort Leavenworth that the post was without a stable, and the "horses are only sheltered from the weather by a mass of brush and dirt that was thrown up temporarily for that purpose" last December with what materials were on hand. The post was also in need of storehouses for the quartermaster and commissary stores. With regard to the quarters, Green stated that "The Officers on duty at the Post (three in number) are living in three small huts. The Quarters occupied by the enlisted men consist of a poor set of log huts, nearly all of them without windows, and so low that a man can scarcely stand upright in them; without floors and are much in need of repair. I would therefore respectfully recommend that material and mechanics be furnished to put this post in a proper state of repair." (NA 1865-1869:J. Green to G. Smith, 7 February 1866).



Figure 2.7. Sketch by T. R. Davis of Fort Larned. From Harper's Weekly, 8 June 1867. (Courtesy of Kansas State Historical Society.)

On 20 February 1866 Fort Ellsworth was officially established as a permanent post (NA 1865-1869:Council of Administration, 30 June 1866). With that designation, plans started to be made to set boundaries for a military reservation and to upgrade the post physically. The post, however, had difficulty in surveying the military reservation. In order to complete this task, specific engineering tools and know-how was needed, and both were lacking at the post. In a letter to headquarters on 12 March 1866, Kilburn Knox stated that it was impossible for any of the officers to make the survey due to the lack of instruments. It was his suggestion that an officer of the engineers be ordered to the post to complete the survey (NA 1865-1869:K. Knox to Col. Reeve, 12 March 1866). In March the boundary lines were unofficially set as follows: the eastern boundary was formed at Clear Creek; the western boundary extended five miles west from the post; the northern boundary extended five miles north from the post; and the southern boundary extended five miles south from the post, "Making a reservation of ten miles square" (NA 1865-1869:Special Order No. 15, 2 March 1866).

Three fires broke out at the post in early April. The first fire occurred on 8 April 1866 in the area of the government hay stacks. The fire began in the afternoon while the commanding officer, Kilburn Knox, was busy receiving stores from a Fort Zarah wagon. When notified of the fire, he had the entire post turned out to put out the flames. After a quiet night, the fire caught again the following morning and a large amount of hay was destroyed. Knox made a request for an investigation into the fire (NA 1865-1869:K. Knox to R. Torrey, 9 April 1866). The third fire started on 12 April at 8:30 p.m. This time the fire destroyed all of the hay remaining, estimated to be about 70 tons. Fortunately, the fire was prevented from spreading to the storehouses and quarters (NA 1865-1869:K. Knox to R. Torrey, 12 April 1866).

Specific plans began to be made in April for a new, upgraded post. In a 16 April 1866 report, a list of the buildings needed to sufficiently garrison the troops and supplies for one year was made. The buildings included at least six sets of quarters, four kitchens, three mess rooms, two storerooms, three offices, three stables, and a hospital. These estimates were designed to provide for two companies of the 2nd U.S. Cavalry with field and staff, band, and headquarters; two companies of the 3rd U.S. Infantry; and the space required for a year's supply of quartermaster and commissary stores. In justification for the number of buildings listed, it was also stated in the report that, "The old Quarters at this post consists of low log huts without windows of any description which are utterly irreparable and in Summer will be entirely uninhabitable" (NA 1865-1869:J. Green to Asst. Adj. General, 16 April 1866).

By June of 1866 building of the new post had commenced. This is documented by Special Order No. 68, dated 15 June 1866, which ordered the acting assistant quartermaster to issue paulins or old canvas to all company commanders for use as rain shelters by men working on the building of the new post (NA 1865-1869:Special Orders No. 68b, 15 June 1866). The chosen site of the new post was three-quarters of a mile to the northeast of the 1864 post.

In a "Description of Fort Ellsworth, Kansas and Reservation," prepared by William Hoelcken, Chief Engineer of the Department of Missouri, and sent to the Adjutant General of the U.S. Army on 15 October 1866, the original site of Fort Ellsworth was described:

Fort Ellsworth is situated on the east bank of the Smoky Hill River, on an elevated piece of ground, about thirty feet above the water. There are about a dozen buildings, which are made of logs set into the ground "post fashion," with roofs constructed of poles and brush, and a coat of about six inches of sand. About one mile north east of the present Fort, on an excellent elevation, are being erected buildings, for the new Post; the company quarters are being built after the same style as the old ones, but more substantial and better timber is being used (NA 1866-1938:Engineer's Office, 15 October 1866).

The official military reservation was designated by the President of the United States on 3 November 1866. The reservation encompassed the following: Sections 19, 30, and 31 of T15S, R7W; Sections 22-27 and 34-36 of T15S, R8W; Section 6 of T16S, R7W; and Sections 1-3 of T16S, R8W (Figure 2.8) (NA 1866-1938:A. Funk to F. Foster, 2 May 1938; NA 1866-1938:Engineer's Office, 15 October 1866).

A map and a drawing were made at this time showing the geographical location of the fort. The map, "Military Reservation at Fort Ellsworth, Kansas," dated 15 October 1866, shows the location of the original fort in Section 35 (Figure 2.8). The drawing is a topographical sketch by Daingerfield Parker, the commanding officer at the post on 7 November 1866. Although not to scale, the map shows the fort in relation to the numerous rivers in the area (Figure 2.9) (NA 1865-1869:D. Parker to L. Thomas, 7 November 1866).

Work continued on the new post throughout the fall, although it was slowed up on occasion due to the heavy details of infantry sent out from the post on escort duty. With the onset of winter, the commanding officer, Daingerfield Parker, wished to push forward the work on the new quarters as rapidly as possible because the "temporary huts-at this Post such as they are-are not sufficient to accomodate all the officers now stationed here" (NA 1865-1869:D. Parker to Lieut. Bonsall, 6 November 1866).

In November of 1866 a request was forwarded to the adjutant general of the U.S. Army to have the name of the post changed. Alfred Gibbs, the commanding officer, stated, "It is generally understood that it [Fort Ellsworth] is named after the Officer who erected a block house here, and who was afterward dismissed [from] the service for various unofficerlike and ungentlemanly offences." Suggestions for the new name of the post included Fort McQuesten and Fort Buford. The chosen designation, Fort Harker, was ordered by Major General Hancock in honor of General Charles Garrison Harker (NA 1865-1869:A. Gibbs to L. Thomas, 21 November 1866; NA 1865-1869:Orders No. 5, 22 November 1866; NA 1866-1938:General Order No. 22, 17 November 1866). Born in New Jersey in December of 1835, General Harker graduated from West Point in 1858. By 1861 he had been promoted to the rank of colonel. From 1861 to 1864 he participated in

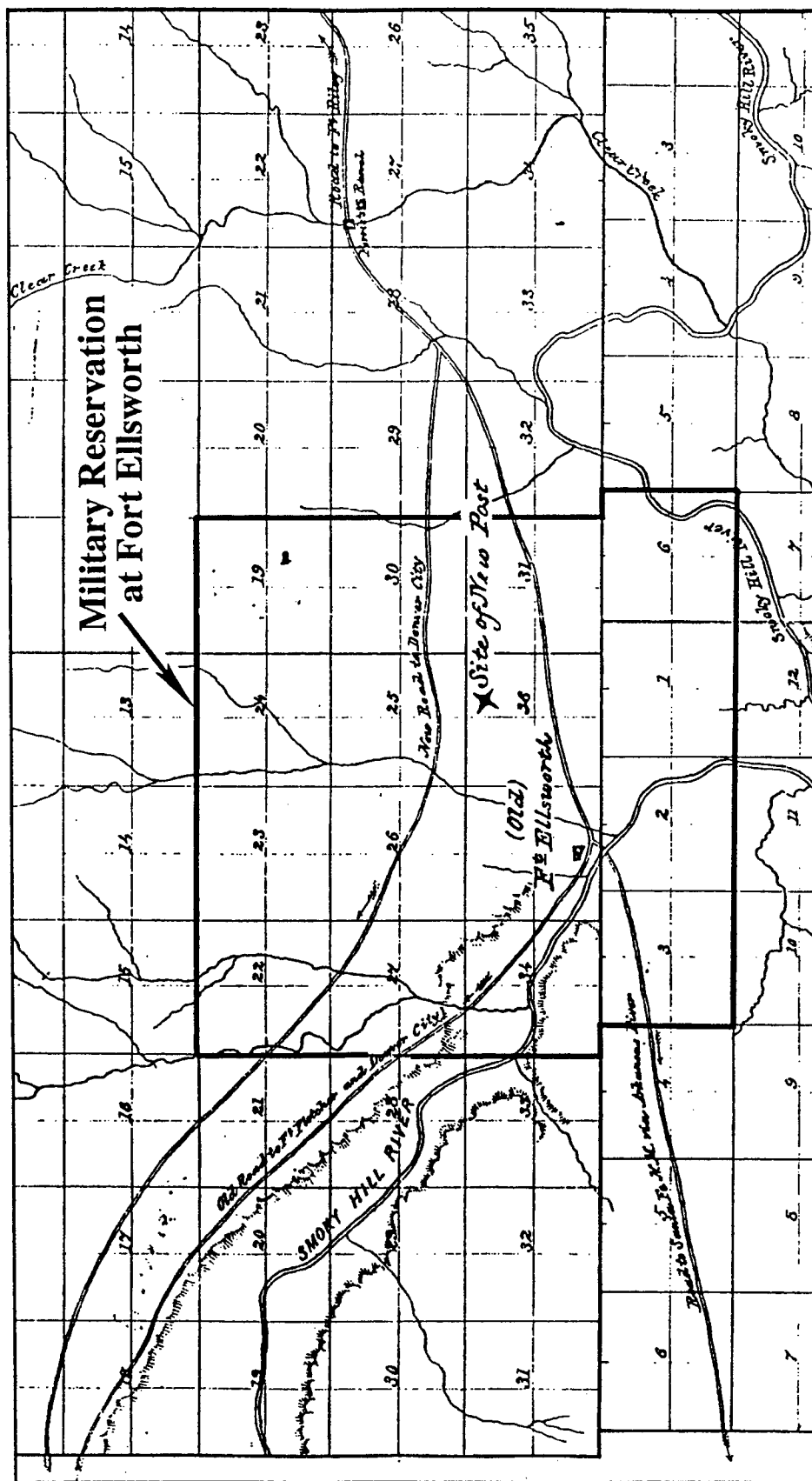


Figure 2.8. Map detailing *Military Reservation at Fort Ellsworth, Kansas*. Map by Engineering Office, Department of the Missouri, 15 October 1866. (Courtesy of National Archives.)

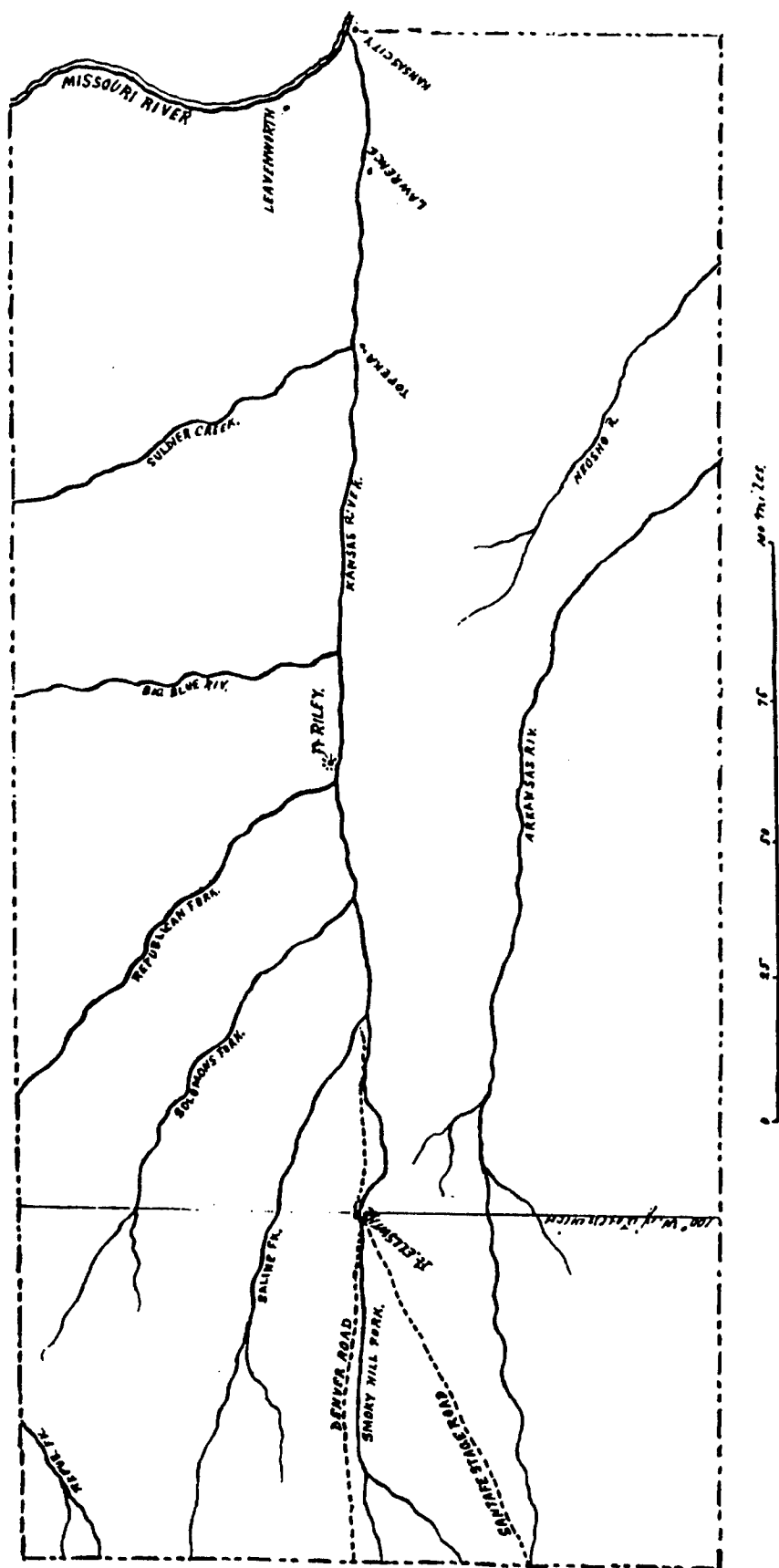


Figure 2.9. Topographical sketch of Fort Ellsworth in relation to major roads and rivers in Kansas. Sketch by Daingerfield Parker, 1866. (Courtesy of National Archives.)

the battle of Shiloh, the siege of Corinth, the battle of Chicamauga, and the battle at Chattanooga. During the Battle of Kenesaw Mountain on 27 June 1864, General Harker died from fatal wounds (King 1996:5-6).

While work continued through the winter at the new post, many men and officers continued to live at the original post (Mattes 1947:18). One of these officers was Lieutenant Frank Baldwin. Alice Blackwood Baldwin vividly described the two-room dugout she and her husband lived in while their quarters were being constructed at Fort Harker. Mrs. Baldwin's first impressions of the dugout provide a rare glimpse into the interior of these structures. Her description of the front room of the dugout, the kitchen, is as follows:

When I first entered my new abode I gazed with disgusted disappointment around the bare, squalid room. Its conveniences were limited to one camp chair, two empty candle boxes, and a huge box stove, red with rust and grime, its hearth gone and the space filled with a tobacco-stained hill of ashes, the peak of which was surmounted by "chewed-out quids" of unknown vintage--but they were there! The sordid interior filled me with gloom, scarcely lessened by the four-paned glass window, dirty, dim, and curtainless (Baldwin 1928:122).

Upon further exploration of the kitchen, she wrote:

I found the kitchen scarcely big enough to contain a stove, and such an array of cooking utensils as I have never beheld lay on the dirt floor and on a packing box, which served duty as a kitchen table! The walls of the kitchen were stayed and supported by logs, while the ceiling was of the same material and covered with dirt. The logs had not been trimmed or cut off, and obliged one to bend low when passing underneath (Baldwin 1928:123).

Meals were prepared in the kitchen by a servant, a Dutchman by the name of John Lick, and during the winter wolves often gnawed and scratched around the kitchen door. A few steps led up from the kitchen to the outside (Figure 2.10) (Baldwin 1928:122, 125)

The inner room, the so-called "drawing room," had a board floor, which was unplanned and full of splinters. The dirt sides and ceiling of the room were covered in canvas, which sagged in the center. The canvas would also tremble when the rats and mice ran across the beams above. The rodents were visible at one end of the room where the canvas cover ended prematurely. Mrs. Baldwin stated that "the pack-rats would perch on the beams, rear up on their hind legs, with their bushy tails hanging below, and survey me with their beady eyes. I was an unwonted (and probably unwanted) sight to them, and I am sure they were to me. But finally we became used to each other, although they raced and ran over my head, indifferent to my attempts to oust them with my broom." Meals were taken by Mr. and Mrs. Baldwin in the drawing room, and a portion of the drawing room was partitioned off by gray army blankets to form a bedroom. Mrs. Baldwin cut a small hole in the blanket to form a peephole in order to insure her privacy (Baldwin 1928:123, 126). During her first

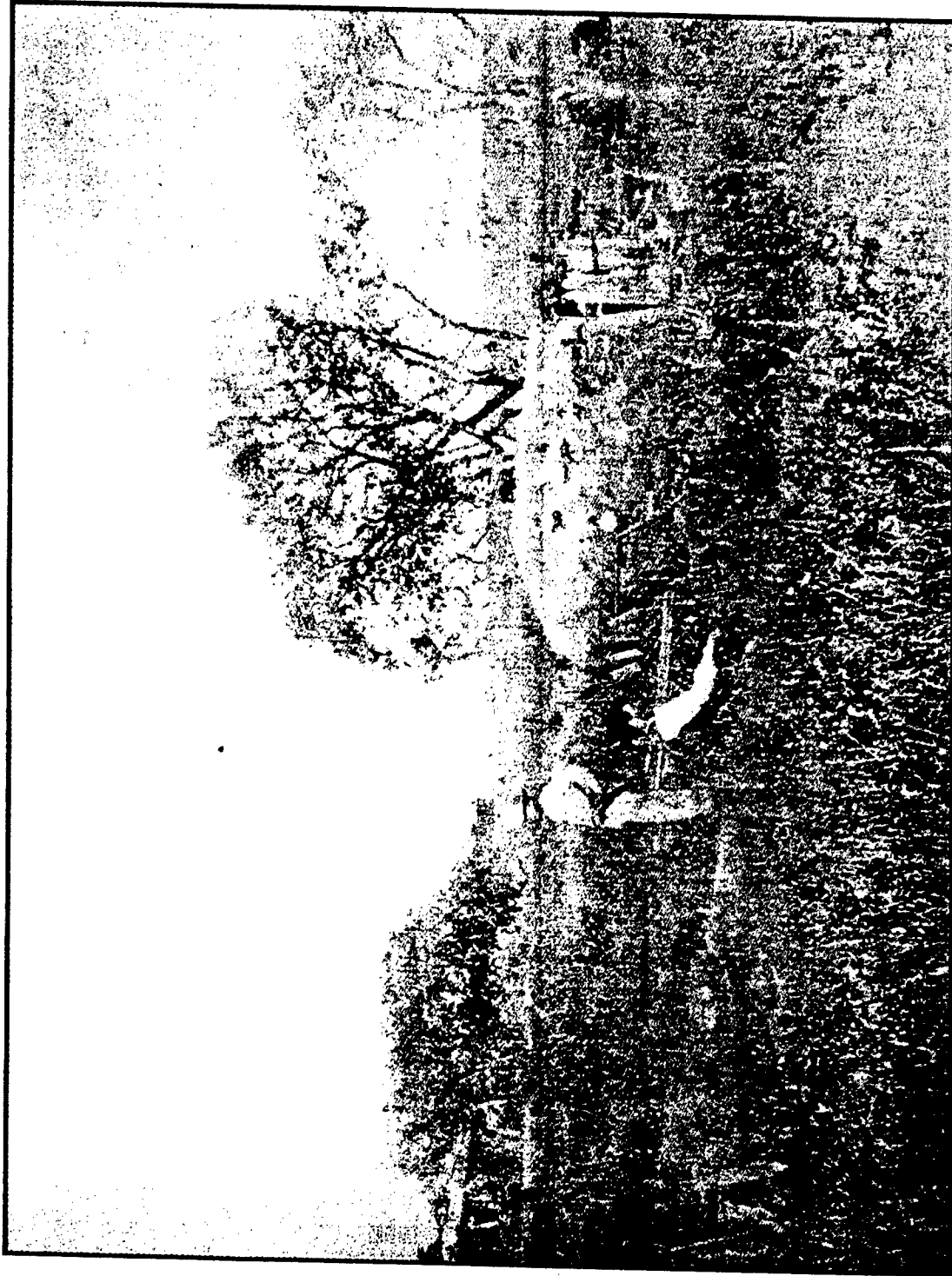


Figure 2.10. Gardner photograph of dugout at workmen's ranch, Ellsworth County, 1867. (Courtesy of Kansas State Historical Society.)

meal in her new drawing room, Mrs. Baldwin noted that "[a] top of a box served as a table and a newspaper for a tablecloth, and at the two plates were napkins made from the squares of flour sacks, with the blue brands still on them" (Baldwin 1928:125).

Mrs. Baldwin also described the temporary log house occupied by Commanding Officer Daingerfield Parker and his wife:

The exterior could in no way be distinguished from any of the others, but the interior seemed like a sumptuous palace to me, with its curtains and draperies of turkey red calico, bought at the post sutler's store. There were buffalo robes to cover the rough flooring and portable book shelves on the walls. Two low trestles on which were placed boards, with a straw tick or mattress, was made to do duty as a couch, and was both comfortable and beautiful, with its bright Indian blanket (Baldwin 128:126-127).

Another structure she described belonged to the post quartermaster, Lieutenant Wells Willard, and his wife, who "occupied a log house consisting of one room, which was a drawing room, kitchen, and bedroom combined. There was but one small window, but it was plenty large enough to lighten the limited space within and if small, and lacking in the plainest and most necessary furniture and conveniences, the warmth of welcome extended to the stranger within its gates was unbounded and made up for all deficiencies" (Baldwin 1928:127).

It is uncertain, however, whether the log houses described above by Mrs. Baldwin were located at the original post or at the new one. It is known that by November and December of 1866 the new post was occupied by two companies of infantry and one troop of cavalry (Baldwin 1928:126). However, in a February of 1867 quartermaster letter, it was noted that the stables, quartermaster storehouse, and officers' quarters were still only partially completed at the new post. The old quartermaster storehouse was described as "a mere Hovel covered with Canvas. The Quarters at present occupied by officers at Post are small log buildings of one room each and I have not made plans of those buildings as it is the intention of the Commanding Officer to have them torn down as soon as the Quarters now in course of erection are completed" (NA 1794-1915:S. Brown to M. Meigs, 11 February 1867).

Mrs. Baldwin mentioned other structures around the fort as well. They included a log officers' mess, a commissary store, and a sutler's store (Baldwin 1928:124, 127, 129). One description and a sketch exists of the sutler's store. The description is as follows: "The front entrance of the establishment was level with the roof. A flight of stairs led down to the main floor, where the customer edged his way through exceedingly narrow rooms stacked head-high with groceries, cloth and other necessities of pioneer life, such as bridles and bullwhips. Shoppers could leave through a door in the rear which opened on the roof of a neighboring dugout" (Mitchell 1987:2). A sketch, entitled "Sutler Store, Fort Harker," made by George Snyder in 1866, is the only drawing known to exist of a structure at the original post (Figure 2.11). The sutler's store, which doubled as the post office, was completed and moved to the new post location in December of 1866 (King 1996:6).

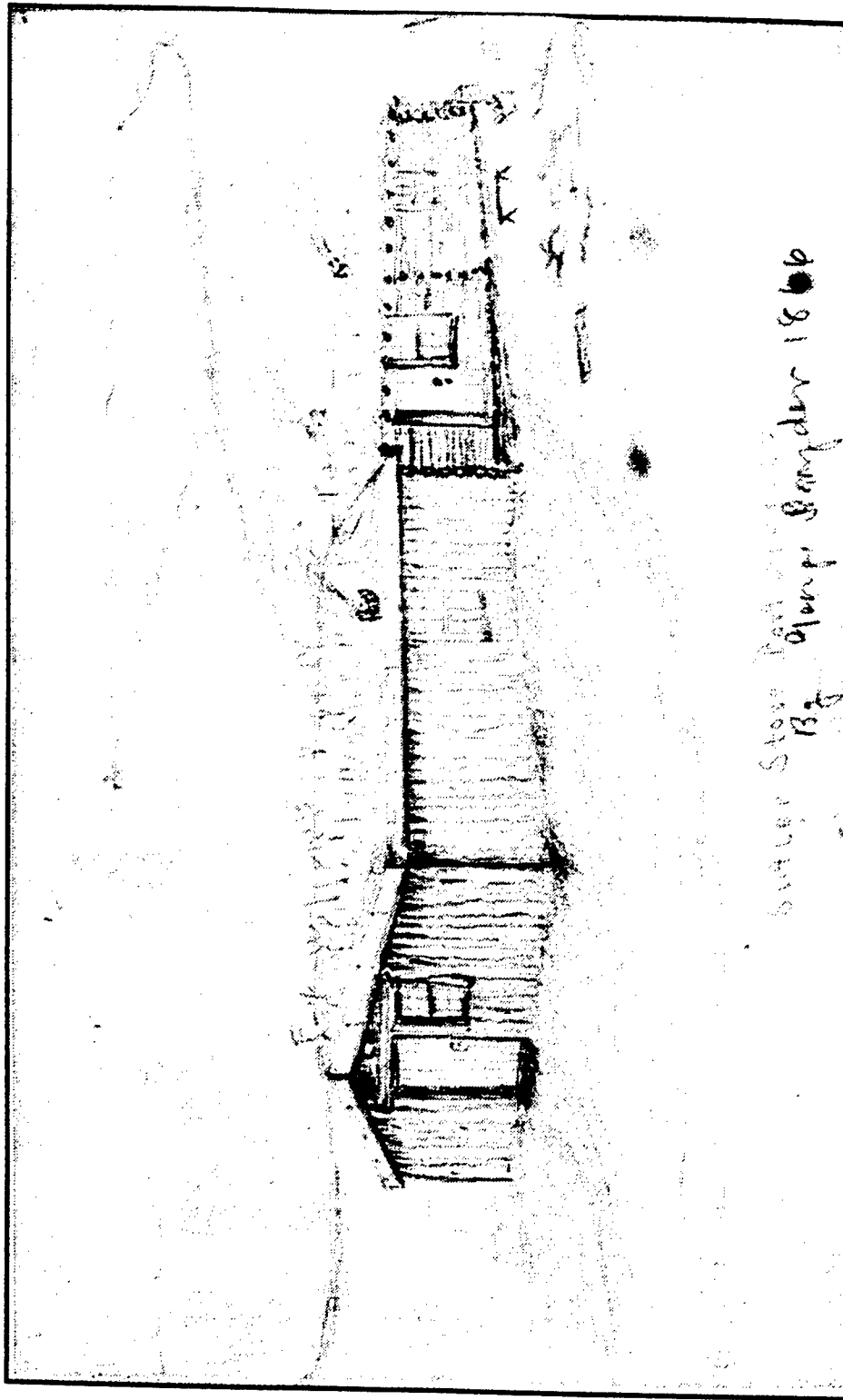


Figure 2.11. 1866 drawing by George Snyder of sutler's store at Fort Harker. (Courtesy of Salina Public Library, U. S. Cavalry Museum, and Fort Riley Historical Society.)

Another structure that was built at the post was a quartermaster's storehouse. A 25 January 1867 report confirmed the presence of a quartermaster storehouse at the original post. "The Quartermaster stores are now at the old post in a very insecure and insufficient building" (NA 1865-1869:A. Gibbs to H. Noyes, 25 January 1867).

A guardhouse was constructed at the original post, as evidenced by a letter documenting a small fire taking place on 28 January 1867. The fire destroyed the "old Guard House at the old Post. No public property was destroyed and the loss was rather a gain as it caught at a favorable time. Had the wind been in the opposite direction the whole Quartermaster Dept. would have gone there being only half a dozen buckets at the Post and the material mere timber" (NA 1865-1869:A. Gibbs to H. Noyes, 29 January 1867). The guardhouse, however, was in use at that time. A second letter a few days later ordered company commanders to issue replacement clothing to members of their companies who were prisoners in the post guardhouse during the time of the fire. The old guardhouse was being used due to the lack of stovepipes to heat the guard tent at the new post (NA 1865-1869:Post Orders No. 4, 30 January 1867; NA 1865-1869:A. Gibbs to L. Easton, 31 January 1867).

Another structure located at Fort Ellsworth was a bakehouse. In a letter dated 7 February 1867, Alfred Gibbs, commander of the post, writes to Col. M. R. Moran, Chief of Commissary Subsistence of the Department of the Missouri, that the bake oven "is almost entirely unserviceable and irreparable, it is a mile and a quarter from the new post and without possibility of removal, being dug in a bank." Gibbs claimed that the daily issue was about 250 loaves of bread, and that "the bakery is called on almost daily to supply detachments, travelers, and trains." Gibbs requested bricks, iron doors, and iron door frames in order to build a new bake oven at the new post. Lack of facilities and fuel of the proper quality hampered the post constructing their own oven. Gibbs needed 1,000 fire bricks, 10,000 common bricks, two iron doors measuring 2 by 2 1/2 ft., and two iron door frames measuring 2 by 2 1/2 ft. Gibbs felt if the fire bricks were furnished from the quartermaster depot at Fort Leavenworth, the common bricks could be obtained from Solomon City (NA 1865-1869:A. Gibbs to M. Morgan, 7 February 1867).

Combined together, the above accounts spanning 1864 to 1867 suggest that Fort Ellsworth was primarily made up of an informal grouping of temporary structures that were not surrounded by any type of stockade. One or two-room dugouts and log huts served as quarters for the soldiers and officers. Other structures described in the accounts include a blockhouse, a makeshift shelter for horses, a sod commissary storehouse, a quartermaster storehouse, an officers' mess, a sutler's store, a guardhouse, and a bakehouse. Based on the descriptions, all of these structures appear to have been made largely from materials on-hand, such as logs, sod, sand, and brush. No documentation exists of any frame or stone buildings having been built at the post (Ziegler 1996:17-18).

By the spring of 1867 the quarters and other buildings at the new post were completed, and the original post along the river was abandoned by the military. In June of 1867 the buildings were ordered razed to the ground, although it appears that the sutler's store was still standing by November of 1867. In the listing of the accounts of the post sutler in November 1867, the "Fort Ellsworth

Building" was listed as being worth \$250.00. Thus, it would seem the building had not been torn down like the others by that time (Choitz 1967:7; Ellsworth County Historical Society [ECHS] 1867-1868:14 November 1867).

The post was not completely uninhabited, however, in 1867. After the decision was made to move Fort Ellsworth, it seems that Joseph Lehman reoccupied his former landholdings. A letter dated 17 May 1870 from J. Edwards of Ellsworth to Senator Ross states that Arthur Larkin purchased from Joseph Lehman the W of the SW of Section 36 and the E of the SE of Section 35, T15S, R8W. Lehman's patent was dated 20 September 1866. When Larkin tried to take possession of his land and establish a store, he was stopped by the post commandant until an investigation could be made (NA 1866-1938:J. Edwards to Senator Ross, 17 May 1870).

In a letter to General Townsend of the War Department, dated 6 June 1870, Commissioner Wilson of the Department of the Interior stated that the tract was patented to Joseph Lehman, a preceptor whose first settlement was made in July 1860, on the 20th day of September 1866 being some time previous to the executive reservation and six years after the inception of preceptors title. By Section 3 of the Act of 29 January 1861, providing for the admission of Kansas into the Union, there were granted to the State for the use of schools Sections 16 and 36 of every township of public lands in the state not otherwise disposed of. Hence the reservation of Section 36, T15S, R8W, was set aside for school purposes. However, this regulation was subject to preemption right where the settlement of Lehman was prior to the survey of the school section. The commissioner thus recommended that "some other section be reserved for the uses of Fort Harker, should the sixteen sections already segregated be found insufficient" (NA 1866-1938:Commissioner Wilson to General Townsend, 6 June 1870). Prior to the sale of the Fort Harker Military Reservation in 1880, an appraisal of the tracts within the reservation was completed. The two aforementioned sections of land were still listed as being owned by Joseph Lehman, although from biographical sources, it is known that Lehman moved out of Saline County by 1867 (Campbell 1928a; NA 1866-1938:List of Tracts, [15 June 1880]; Vassar 1988:195-197).

Also prior to the sale of the reservation was an effort to remove the soldiers buried at the original fort. In a letter dated 10 May 1880, it was noted that "there is entered on the Reservation (at the site of the old Fort Ellsworth) the remains of some twelve or fifteen deceased soldiers. If it is the desire of the Government to remove them to the National Cemeteries, I would respectfully inform the Quartermaster that I would undertake their removal, furnishing boxes, etc; also making a record of the names, companies, and regiments as far as the head boards will admit. The remains are all in one spot of ground of about one fourth of an acre" (NA 1795-1915:I. Marks to Depot Quartermaster at Fort Leavenworth, 10 May 1880). One documented funeral occurred at Fort Ellsworth on 10 April 1866. The funeral of Private James McBride of Company F, 2nd U.S. Cavalry took place at 3:00 p.m. Company F of the 2nd U.S. Cavalry was ordered to attend the funeral with side arms, and the commanding officer of the company detailed one corporal and eight privates as a funeral escort (NA 1865-1869:Special Order No. 25, 10 April 1866). According to the post returns, approximately nine soldiers died from disease during the existence of the post (NA 1965:Post Returns, October 1864 - January 1867).

Military Units and Civilians at Fort Ellsworth

From 1864 to 1866 Fort Ellsworth was home to approximately 10 different commanding officers and 17 companies of both infantry and cavalry regiments. For the most part it was occupied by one or two companies at a time. However, occasionally there were up to six companies stationed there at once. A review of the Fort Ellsworth Post Returns provides a good indicator of the increasing growth and importance of Fort Ellsworth to the military over a period of about two years.

The earliest post return that exists dates to October of 1864, just five months after the post was established by Lieutenant Ellsworth and 40 men of Company H, 7th Iowa Volunteer Cavalry. The commanding officer in October was 1st Lieutenant Henry W. Garfield. Garfield arrived at the post on 17 September 1864, and he remained the commanding officer through January of 1865. Garfield was a member of Company H, 7th Iowa Volunteer Cavalry. From October to December of 1864, Garfield commanded an average of 55 men. In January of 1865, 48 men of Company L of the 2nd Colorado Cavalry were stationed at the post in addition to 60 men of the 7th Iowa (NA 1965:Post Returns, October 1864 - January 1865).

Beginning on 7 February 1865, Captain Curtis Clark was the commanding officer of the post. He was a member of the 7th Iowa as well. Clark served from February to September of 1865. Under his command, there were primarily two companies of cavalry and infantry. In February of 1865 there were 65 men of Company L, 2nd Colorado Volunteer Cavalry, and 54 men of the 7th Iowa Volunteer Cavalry. From March to August, there was an average of 49 men of the 7th Iowa, and 68 men of Company C, 2nd U.S. Infantry. Company C was one of the regiments of "Galvanized Yankees." Galvanized Yankees were confederate prisoners who earned their release from prison by volunteering for Western duty. William Darnell, a teamster employed at Fort Riley, was accompanied by members of this regiment while driving a train of 25 wagons from Fort Riley to forts Ellsworth, Zarah, Larned, and Dodge. He noted that:

These Confederates . . . were a miserable looking, decrepit lot, run down physically, and unable to make a long march. . . . On account of their poor physical condition, orders had been given to limit the daily marches of these "galvanized soldiers" to eight miles a day, the teams also being limited to an eight-mile haul instead of the usual twenty-mile haul (Brown 1986:45-46).

Company C left Fort Ellsworth on 28 August 1865. It was replaced by two companies of the 13th Missouri Volunteer Cavalry. Companies A and F consisted of 62 and 61 men respectively (NA 1965:Post Returns, February - September 1865).

Following Captain Clark as post commander were two men that served a period of one month each. Major Hiram Hilliard commanded the post in October of 1865. He was a member of the 17th Illinois Cavalry. Companies A and B of the 17th Illinois numbered 143 men. Two other companies were also stationed at Fort Ellsworth during the month. They were Companies A and F

of the 13th Missouri Volunteer Cavalry, and they were comprised of 145 men. The next commanding officer was 1st Lieutenant Charles H. Lester. Lester was a member of the 2nd U.S. Cavalry, and he took command of the post on the 25 November. Only one company, Company I of the 2nd U.S. Cavalry, was stationed at the post under his command, and they numbered 56 men (NA 1965:Post Returns, October - November 1865).

From 30 December 1865 to February of 1866, Brevet Lieutenant John Green was the commanding officer. He was a captain of the 2nd U.S. Cavalry. During this period, he commanded two companies of both infantry and cavalry. Both Company F of the 2nd U.S. Cavalry and Company D, 2nd Battalion, 13th U.S. Infantry averaged 48 men each during the three months (NA 1965:Post Returns, December 1865 - February 1866).

During the month of March 1866, the post was under the temporary command of Brevet Major Kilburn Knox. Knox was a captain of the 13th U.S. Infantry. Knox held the post command for only one month. Stationed at the post during this time were 40 men of Company F of the 2nd U.S. Cavalry and 26 men of Company D, 2nd Battalion, 13th U.S. Infantry. Knox was relieved by Brevet Lieutenant John Green during the month of April. Thirty-nine men of Company F of the 2nd U.S. Cavalry were still stationed at the post, but Company D of the 13th U.S. Infantry left the post on 28 April (NA 1965:Post Returns, March - April 1866).

Lieutenant Colonel I. N. Palmer took up the reins of command after Brevet Lieutenant Green. Palmer served at the post from May through August of 1866. Palmer was a member of the 2nd U.S. Cavalry. During this period, Fort Ellsworth served as the headquarters for the 2nd U.S. Cavalry. One to two members of the general staff were present each month, and anywhere from 76 to 208 members of the Field Staff, Band, and Companies F and L of the 2nd U.S. Cavalry made their homes at the post. Also stationed at the post during these four months were Companies F and H of the 3rd U.S. Infantry. These two companies averaged a total of 118 men. The highest number of men stationed at the post in a single month under Palmer was 333 men (NA 1965:Post Returns, May - August 1866).

The next commanding officer of Fort Ellsworth was Captain John H. Page. Page was a Brevet Major of the 3rd U.S. Infantry. He served at the post for only one month. The post still served as headquarters for the 2nd U.S. Cavalry and carried a general staff of 2. However, the 2nd U.S. Cavalry Field Staff, Band, and Companies F and L left the post in mid-September. One hundred twenty-one member of Companies F and H, 3rd U.S. Infantry, remained at the post (NA 1965:Post Returns, September 1866).

Captain Daingerfield Parker, a Brevet Major of the 3rd U.S. Infantry, relieved Captain Page as commanding officer on 22 October 1866. He served the post through the month of December. Under his leadership, the post was garrisoned with the following regiments: two to three members of general staff; an average of 139 men of Companies F and G of the 7th U.S. Cavalry; an average of 126 men of Companies F, H, and K of the 3rd U.S. Infantry; 20 men of Company E of the 19th U.S. Infantry in November; and 48 men of Company E of the 37th U.S. Infantry in December. Under

Captain Palmer, the post reached its highest number of garrisoned men under a commanding officer in a single month. The total was 340 men in October of 1866 (NA 1965:Post Returns, October - December 1866).

In January of 1867, as completion of the new post neared the end and preparations began to be made to abandon the original post, Brevet Major General Alfred Gibbs commanded Fort Harker. Gibbs was a major of the 7th U.S. Cavalry. He presided over a general staff of two men, 153 men in Field Staff and Companies F and G of the 7th U.S. Cavalry, 107 men of Companies H and K of the 3rd U.S. Infantry, and 46 men of Company E of the 37th U.S. Infantry. Gibbs held the position of post commander through March of 1867 (NA 1965:Post Returns, January - March 1867).

Biographical information was available on four of the commanding officers of the post: John Green, I. N. Palmer, John H. Page, and Daingerfield Paker. John Green was born in Germany in 1825. His family moved to America by 1832, where they settled in Ohio. John was educated in the public schools in Crawford County, Ohio, through 1842. Green joined the Army in 1846, where he became a member of the Mounted Rifles. He was appointed captain of the 2nd Cavalry in 1861, breveted major in 1863, and appointed lieutenant colonel in 1865. He retired for age in 1889 and was appointed colonel in 1904 by an act of Congress. Green was also awarded a Congressional Medal of Honor during his career. He died in 1908 (Marquis--Who's Who 1968:481).

Innis Newton Palmer was born in New York in 1824. He graduated from the United States Military Academy in 1846. He served in the Mexican War, and some of his major engagements included Cerro Gordo, Churubusco, Chapultepec, and the march on Mexico City. During the period between the Mexican War and the Civil War, Palmer served in Oregon, Washington, Texas, and the Indian Territory. He was a member of both the Mounted Rifles and the 2nd U.S. Cavalry. He was promoted to major in 1861. Palmer served throughout the Civil War and participated in the defense of Washington, the Army of the Potomac, and held various posts in North Carolina until July of 1865. After the war, he was promoted to brevet colonel and was given command of the 2nd U.S. Cavalry, of which he had been a member since 1855. The remainder of his career was spent in the west, where he commanded several forts, including Fort Ellsworth. He became a full colonel in 1868, and he retired in 1879. He died in Maryland in 1900 (Malone 1934:184-185).

John Henry Page was born in Delaware in 1842. His early education took place in Italy and France, and he was a student at Northwestern University when the Civil War began. Page entered service in 1861, and he became a private in the Chicago Light Artillery. Throughout the rest of the war, he was a member of the 3rd U.S. Infantry. Page fought in many of the major engagements with the Confederacy, including Fredericksburg, Gettysburg, Chancellorsville, and Appomattox. In 1863 he was appointed major "for gallant and meritorious services" in the battle of Gettysburg. After the war he served in Kansas. Page would later establish Camp Supply in 1868. Page continued to serve in the west up until the outbreak of the Spanish-American War in 1898. Page commanded in Cuba and the Phillipines until 1902. He retired in 1903 and died in 1916 (Marquis Who's Who 1968:928).

Daingerfield Parker was born in New York in 1832. He was educated in various schools and academies before joining the U.S. Army in 1861. He served as the subaltern and captain of the 3rd U.S. Infantry from 1861 to 1884. During the Civil War he fought at 1st and 2nd Bull Run, Antietam, Fredericksburg, and Chancellorsville. For his service at Gettysburg he was breveted. After the Civil War he commanded a military prison in St. Louis, and troops at the opening of the Cheyenne strip. He retired in 1896, was promoted to brigadier general in 1904 by an act of Congress, and died in 1925 (Marquis Who's Who 1968:934).

Also stationed at Fort Ellsworth during this period were military physicians. In December of 1865 it was recorded that there was no medical officer or medicines of any kind at the post. As the men were in much suffering due to diarrhea and other diseases, a request was issued for either a medical officer or the authority to hire a citizen physician until a military one could be ordered to the post (NA 1865-1869:F. De Courcy to J.E. Jacobs, 2 December 1865). According to post returns, the first surgeon, George F. French, was appointed on 12 February 1866 (NA 1965:Post Return, February 1866). Another surgeon that served at the post was George M. Sternberg. Sternberg was appointed to Fort Ellsworth on 4 May 1866, and he served up through the move to the new post in the spring of 1867 (NA 1965:Post Return, May 1866).

Many civilians lived and worked at Fort Ellsworth during the course of its existence. Within the quartermaster department, civilians filled the positions of blacksmiths, teamsters, saddlers, carpenters, masons, wagon masters, and guides. In the subsistence or commissary department, a civilian clerk was employed. Other civilians worked as physicians and laundresses, and two final groups of uncompensated civilians were post sutlers and officers' wives.

The Fort Ellsworth post returns from October of 1864 to December of 1866 document the number and wages of civilians hired to complete quartermaster and subsistence duties. The number of civilians hired in the subsistence department was tallied in the post returns. One clerk was employed on a regular basis throughout the period from March to December of 1866. The clerk was paid \$100.00 a month. Beginning in January of 1866, the quartermaster department employed a regular number of civilians each month. The number of blacksmiths employed was two, and they were paid \$75.00 a month or \$3.00 a day. The number of teamsters employed varied by month, but in general ranged from three to 34. The wage for teamsters was \$35.00 a month. Only one saddler was employed each month, and he made \$75.00 a month. Carpenters and masons began to be employed in July of 1866, most likely to build the new post. The number of carpenters ranged from two in July to 11 in December, and they were paid \$75.00 a month. Also employed was a master carpenter, who was paid a slightly higher wage of \$80.00 a month. The number of masons ranged from seven to 15, and they were paid the same as carpenters. A master mason was also employed at the rate of \$80.00 a month. The number of wagon masters varied each month, but by late 1866 a regular number of two civilians were being employed for this job. Wagon masters were paid \$75.00 a month. The final type of position the post quartermaster offered was that of a guide. For the most part, only one guide was on the payroll each month at a wage of \$80.00. However, in some months, more guides were hired for specific time frames. In July of 1866, two guides were employed, one

of them for the dates 10 July to 19 July. Both guides were being paid \$100.00 a month (NA 1965:Post Returns, October 1864 - December 1866).

Men employed as guides or scouts were usually trappers, hunters, trail drivers, or anyone else familiar with the country and the ways of Indians. The mission of scouts was to follow a trail, guide a command, or carry messages from one command to another.

Scouts, guides, and several other kinds of civilian employees such as teamsters and packers were hired by the Quartermaster Department of the army, usually through a post or regimental quartermaster. Scouts were hired by the month and were under no obligation to stay beyond that period, nor were they guaranteed continuous employment. Their pay ranged from \$60 a month to \$150, or even more for especially hazardous missions. A regiment or an expedition might be authorized to employ a number of scouts, in which case one of the most reliable of them was designated chief of scouts and was paid accordingly. In large organizations an officer was also designated chief of scouts; equivalent to the reconnaissance officer or G-2, intelligence officer of the present day (Russell 1960:80).

Two of the most famous guides employed by the quartermaster department at Fort Ellsworth were Wild Bill Hickok and Buffalo Bill Cody (Figures 2.12 and 2.13). In his autobiography, Cody related the story of how he came to be employed as a scout at Fort Ellsworth.

Believing that I could make more money out West on the frontier than I could at Salt Creek Valley, I sold out the Golden Rule House [hotel] and started alone for Saline [Salina], Kansas, which was then the end of the track of the Kansas Pacific railway, which was at that time being built across the plains. On my way I stopped at Junction City, where I again met my old friend Wild Bill, who was scouting for the government, his headquarters being at Fort Ellsworth, afterwards called Fort Harker. He told me that they needed more scouts at this post, and I accordingly accompanied him to that fort, where I had no difficulty in obtaining employment. During the winter of 1866-67, I scouted between Fort Ellsworth and Fort Fletcher (Cody 1991:145).

A man by the name Henry Northrop claims that Cody and himself resided that winter in a dugout located along Mulberry Creek in Saline County, which suggests that some of the employed civilians may not have resided at the fort. In early 1867 Cody was helping haul goods for a store established in Ellsworth by his friend Arthur Larkin, and by the spring of 1867 Cody was at Fort Fletcher (Russell 1960:78).

Civilian physicians and laundresses were also employed at Fort Ellsworth to assist the military physician. On 10 February 1865 James Telfer reported to the post for duty. He worked at the post for only a few weeks before being transferred to Fort Larned (NA 1965:Post Returns, February - March 1865). A man by the name of Whipple was employed as the acting assistant surgeon on 12 March 1865. He remained at the post until 21 July 1865. The next citizen physician



Figure 2.12. Photograph of Wild Bill Hickok, ca. 1865–1866.
(Courtesy of Kansas State Historical Society.)

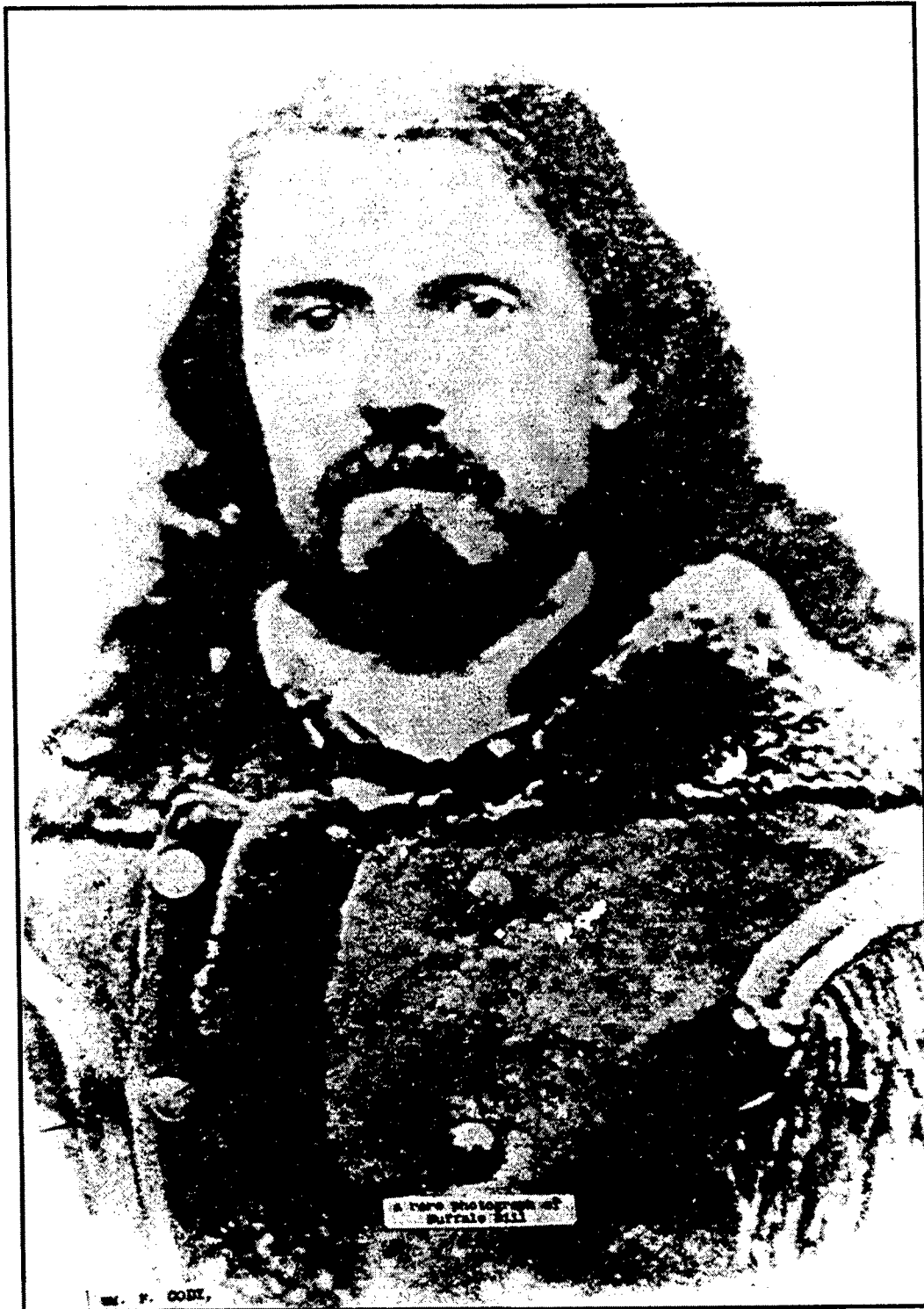


Figure 2.13. Photograph of Buffalo Bill Cody, ca. 1867. (Courtesy of Kansas State Historical Society.)

listed in the post returns was a J. N. Sabine. Thomas B. Chase was the last citizen physician employed at Fort Ellsworth before the move to the new post. Sabine and Chase were both officially noted as acting assistant surgeons (NA 1965:Post Returns, February 1865 - December 1866). Associated with the hospital was another civilian position. On 9 May 1866 Mrs. Margaret Moore was appointed hospital matron at Fort Ellsworth. She was under the direction of the post surgeon on duty (NA 1865-1869:Special Order No. 45, 9 May 1866).

Laundresses were a necessary fixture at frontier posts. A post council of administration held at Fort Ellsworth on 28 February 1866 documented the presence of female laundresses at the fort. The council recorded that "The rate of compensation to Laundresfes [*sic*] employed at the post, or with the companies composing the garrison to be established as follows, viz --- washing for Officers of the post, to be four (4) Dollars per Month, and for enlisted men seventy five (75) cents per month where nothing but government clothing is washed, any other clothing of enlisted men included, to be one (1) dollar per month" (NA 1865-1869:Council of Administration, 28 February 1866). Another post council of administration held on 30 June 1866 updated the wages to 75 cents per dozen for officers and officers' families, and 75 cents a month for enlisted men's government clothing. One laundress was mentioned by name in Special Order No. 17 dated 8 March 1866. The order specified that "Mrs. O'Connell, a Laundress of Company "F" 2nd U.S. Cavalry, will be allowed to retain the Quarters she now occupies until otherwise ordered by the permanent Commander of this post" (NA 1865-1869:Special Order No. 17, 8 March 1866).

The position of laundress solidified when in 1802 Congress authorized four per company. This allowed them to be carried on company rosters and be eligible for quarters and rations. Post laundresses were often the wives of noncommissioned officers, and they typically lived in shanties or log houses some distance from the main part of the post (Knight 1978:6-7, 67). "One of the unwritten laws of the rank and file in the good old days [was] to square with the laundress if you didn't square with anybody else" (Quoted in Knight 1978:68). Regulations stipulated that enlisted men were to pay the laundresses at the pay table, even though the men were to be paid quarterly. The position of laundress was phased out by Congress between 1878 and 1883. This meant that they were no longer eligible for quarters and rations and were no longer placed on company rolls (Knight 1978:68-69).

Two other sets of civilians that could be found at frontier army posts were post sutlers and wives. On 16 December 1865 Ephraim Warner was approved and recommended for the position of post sutler by a council of administration held at Fort Ellsworth. He replaced a Mr. Miller as sutler (NA 1865-1869:F. de Courcy to J. Jacobs, 3 December 1865; NA 1865-1869:Council of Administration, 16 December 1865). Warner was approved a second time on 30 June 1866, as a result of the post being established officially as a permanent post on 20 February 1866. It was also noted at that time that Mr. Warner was from Riley County (NA 1865-1869:Council of Administration, 30 June 1866). Warner also served as the postmaster at Fort Ellsworth (NA 1865-1867:F. de Courcy to Postmaster General, 17 December 1865).

The officers' wives at Fort Ellsworth, although few in number, were an integral part of the life at the post. Alice Blackwood Baldwin mentioned several of the officers' wives and their activities in her journal. The Baldwins ate their first dinner at the officers' mess, where she met Mrs. Kelly, who was the wife of the commissary sergeant. Interestingly, Mrs. Kelly was the one who prepared the meal that night (Baldwin 1928:124). Other officers' wives who were living at Fort Ellsworth included Mrs. Daingerfield Parker, the wife of the commanding officer; Mrs. Thomas Chase, the wife of the post surgeon; and Mrs. Wells Willard, the wife of the post quartermaster. The women bonded together to set up a ball for Mr. and Mrs. Baldwin during the winter of 1866-1867. Mrs. Baldwin described the great lengths the women took to give the post a festive air:

The ball was unique and original, considering much that was necessary to beautify and adorn, but there was not a shop or store within hundreds of miles (save the sutler's store) that was available; so the four ladies of the fort conferred together, and combining tastes, brains and ideas, succeeded in making a "bower of beauty" out of a half-completed stone building . . . The ladies wore their best "bib and tucker" and borrowed of each other and exchanged what one possessed and the other did not "a kindly spirit and mutual interest with us all" (Baldwin 1928:127-128).

The ball encompassed a night of dancing to the music of the company musicians and several civilian employees. Violins, guitars, an accordeon, and a fife played such tunes as the "Virginia Reel." Supper was served by Mrs. Kelly, who worked and supervised the dinner (Baldwin 1928:128).

The officers' wives at frontier posts often formed close friendships. Mrs. Baldwin became close friends with the wife of Post Surgeon Thomas Chase. Mrs. Baldwin remarked that Mrs. Chase was "a very pretty and agreeable woman, and a warm friendship formed with that spontaneity which is often the characteristic of women's intimacies, not always lasting, I regret to state. But in our case, affection and love remained until severed by death." Tragically, Mrs. Chase was a victim of a cholera plague that attacked the post in 1867 (Baldwin 1928:126).

Military Duties at Fort Ellsworth

Military duties at Fort Ellsworth revolved around the daily calls of the post. General Order No. 2, dated 2 December 1865, issued the following daily calls (Table 2.1).

Table 2.1. Daily Calls at Fort Ellsworth.

TIME	CALL
6:00 A.M.	Reveille sounded by Cavalry and repeated by Infantry Musicians Stable call immediately after
7:30 A.M.	Breakfast call to be beaten by Infantry Musician
8:00 A.M.	Sick call to be beaten by Infantry Musician
8:15 A.M.	Fatigue call to be sounded by Cavalry Buglers
9:00 A.M.	Guard Mounting to be beaten by Infantry Musician
9:30 A.M.	Water Call to be sounded by Cavalry Buglers
10:00 A.M.	1st Drill Call to be sounded by Cavalry Buglers
11:30 A.M.	Recall from Drill to be sounded by Cavalry Buglers
12:00 P.M.	Orderly Call to be sounded by Cavalry Buglers
12:30 P.M.	Recall from Fatigue to be sounded by Cavalry Buglers
1:00 P.M.	Dinner call to be beaten by Infantry Musician
1:30 P.M.	Fatigue call to be sounded by Cavalry Buglers
2:00 P.M.	2d Drill call to be sounded by Cavalry Buglers
3:00 P.M.	Recall from drill to be sounded by Cavalry Buglers
3:15 P.M.	Stables to be sounded by Cavalry Buglers
4:00 P.M.	Recall from Fatigue to be sounded by Cavalry Buglers
SUNSET	Retreat to be beaten by Infantry Musician
8:30 P.M.	Tattoo to be beaten by Infantry Musician
8:45 P.M.	Taps to be sounded by Cavalry Buglers
10:00 A.M.	Sunday Morning Inspection Guard Mounting immediately after

This schedule was altered as the seasons and situations changed at the fort. While the above schedule served the post well for the winter months, it was changed the following spring to take advantage of the increased number of daylight hours and warmer weather. On 1 March 1866 the following changes were made to the schedule: breakfast call was moved up to 7:00 a.m.; sick call was at 7:30 a.m.; fatigue call at 7:45 a.m.; guard mounting at 8:00 a.m.; second drill call at 3:00 p.m.; recall from drill at 4:00 p.m.; stables at 4:30 p.m.; recall from fatigue at 5:00 p.m.; and Sunday morning inspection at 9:00 a.m. (NA 1865-1869:General Order No. 4, 1 March 1866).

An enlisted man's day began with reveille and the sound of the cavalry and infantry musicians marching around the post. If the post was without a band, a trumpet or bugle was called upon to start the day. Stable call was the next call to be sounded. Men proceeded to the stables with curry combs in hand to feed and care for their horses, the most important animal at any frontier post.

After breakfast and sick call, fatigue call and guard mounting took place. For fatigue duties, soldiers would consult a posted schedule for drills. Drills took place at Fort Ellsworth before and after dinner. However, frontier soldiers often spent the majority of their time performing manual labor during fatigue. Guard mounting consisted of the formal changing of the the post guard and the officer of the day. In full uniform, the new guard and officer would march on to the parade, and the former guard and officer would march off. The old and new officers would then proceed to the guardhouse, where the old officer would turn over the daily roster to the other. Accompanying them were the old and new guards, where the new guard would be updated on the situation of the post before taking his station at the guardhouse. The evening stable call was followed by retreat. Army regulations required one dress parade a day. It was a highlight of the day for the men and women of the post (Knight 1978:163-171). Alice Blackwood Baldwin, who lived at Fort Ellsworth during the winter of 1866-1867, remarked, "never will I forget the scene, with the four musicians with fife and drum, or the effect that the strains of "Fra Diavolo" played by Bruno, the fifer, had upon me" (Baldwin 1928:125). After retreat the men were free for the evening. Tattoo marked the time for the men to proceed to their quarters. Finally, taps signaled the end of the day. Full-dress inspection was performed every Sunday morning per Army regulations. For the frontier soldiers, it served as a symbol of the passage of time (Knight 1978:163-171).

For commissioned officers the day was filled with a myriad of paperwork and meetings. Each morning was started with a meeting of all the officers present at the fort for conferences and instructions. In addition to the daily post duties, officers presided at garrison court-martials, boards of survey, and post councils of administration (Knight 1978:163-171). At Fort Ellsworth there were usually three officers present--the commanding officer, a company officer, and an officer that sometimes served as the post quartermaster, commissary sergeant, and post adjutant (NA 1965: Post Returns, October 1864 - January 1867). According to surviving letters, it appears that commanding officers wanted a minimum of three officers present in order to fill the positions of commanding officer, post adjutant, post quartermaster, and commissary sergeant. If no other officers were present, the commanding officer was forced to take on the workload of the post quartermaster and commissary sergeant as well (NA 1865-1869:K. Knox to R. Torrey, 6 April 1866). In reply to an order requesting an officer to be transferred to Fort Larned, Commanding Officer John H. Page pleaded for the officer to be retained until another could be sent to the post as they were the only two present at that time (NA 1865-1869:J. Page to Major [?], 1 October 1866).

The primary mission of the enlisted men at Fort Ellsworth was to protect settlers, wagon trains, mail stations, and stage coaches on the Fort Riley/Fort Larned Road and the Smoky Hill Trail. To accomplish this mission, soldiers were detached from the post as escorts and as guards at mail or stage stations along the roads. Escort duty was one of the most important duties at the post. Beginning in June 1864, escort procedures were established by Major T. I. McKenney: "The arrangements I have made in regard to escorting the mails are as follows: The officer at Saline, who has 20 men, will escort to Smoky Hill Fork, and wait for return mail. The officer at Smoky Hill Fork, who has 40 men, will escort to Walnut Creek, and wait for return mail" (U.S. War Department 1893, 34(4):402-404). If an escort was unavailable, the stages often waited at the post until men could be furnished. On 21 October 1864 Commanding Officer Henry Garfield wrote to the commanding

officer at Fort Zarah to explain the reason why the stage did not go through the prior week. It started from here without an Escort. It went about 10 miles and they claimed they saw Indians and they turned and came back. It will be here Sunday I suppose. I shall be unable to furnish any Escort for this reason. I have only 12 Horses in my Command and we do the Escorting East. The Stage will remain here until an Escort comes from the west for I cannot furnish any. I have taken the liberty to inform you of this fact so that you may know how I am situated in regard to Escorting the Stage (NA 1864-1865:H. Garfield to C.O., Ft. Zarah, 21 October 1864).

Over the years of Fort Ellsworth's existence, many detachments of escorts were sent with various types of wagon trains. Some of the trains were filled with government supplies for other forts along the Smoky Hill and Santa Fe trails (Figure 2.1). A sergeant and six enlisted men of Company F, 2nd U.S. Cavalry were detailed to escort a government train to Fort Fletcher. After the stores were delivered, they were ordered to accompany the train back to the post. For the trip they were issued eight days rations and 25 rounds of ammunition (NA 1865-1869:Special Order No. 3, 28 January 1866). Another example is provided in an order dated 27 September of 1866. Companies F and H of the 3rd U.S. Infantry were ordered to escort the train of army contractors Streeter and Strickler to Fort Wallace (NA 1865-1869:Special Orders No. 150, 27 September 1866). Escorts were also provided to government personnel, such as Major Baird, Pay Master. He was to be escorted to Fort Zarah on 6 April 1866 (NA 1865-1869:K. Knox to R. Torrey, 6 April 1866).

Fort Ellsworth also provided escorts for the mail and stage coach companies that traveled the road. Two stage lines served Fort Ellsworth from 1864 to 1866. The first was the Kansas Stage Company. This company had been traveling the road prior to the building of the fort, and had established a station at Joseph Lehman and Daniel H. Page's ranch (Campbell 1928a). The Kansas Stage Company provided a weekly line that ran between Junction City and Fort Larned on the Fort Riley/Fort Larned Road (Ziegler 1996:6).

Fort Ellsworth was also a "home" or "eating station" for the Butterfield Overland Despatch, a stage line that offered triweekly passenger and express service between Atchison, Kansas, and Denver, Colorado, on the Smoky Hill Trail (Choitz 1967:10; Lee and Raynesford 1980; Lees and Shockley 1986:24). David A. Butterfield was the owner of the Butterfield Overland Despatch, also known as the Denver Express. He established the line in order to provide fast service to the new, flourishing town of Denver in Colorado. Before the starting of the service in 1865, survey work needed to be done along the road in order to establish stage stations. Lieutenant Julian R. Fitch, U.S. Signal Corps, was designated as the surveyor for this party, and his account of the trip which began on 13 June 1865 survives. With regard to Fort Ellsworth he stated:

At a distance of Thirty two miles we reached Fort Ellsworth on the western terminus of the great bend of Smoky Hill. Here we were joined by Two Companies of the 13th Missouri Cavalry under command of Cpts McMichael and Snell. After resting a day and killing a few buffalo which we now found in considerable numbers and diverging from the old road we bore a little north of west upon the north side of the

Smoky Hill river near our old trail of 1860 which had at this time become entirely obliterated (Fitch 1865).

The Smoky Hill route, which was shorter than the Platte River route that was used by other freighters, was 592 miles in length. Butterfield began running stages along the route after several stations were established and stocked with grain, forage, and fresh horses. Robert Muir, a citizen of the neighboring town of Salina, wrote to his brother on 10 September 1865 that "Perhaps you can form some idea of the intent the Company [Butterfield Overland Despatch] and the business they expect to do when I tell you that from Abilene 25 miles east of here till fort Ellsworth 35 miles west of here they are having 1100 tons of hay put up exclusiley [*sic*] for there [*sic*] own use." On 11 September the first stage left Atchison. It arrived in Denver after only twelve days (Blackmar 1912:266-267; Lee and Raynesford 1980; Muir 1865).

Fort Ellsworth was Station No. 6 on the Butterfield line. The Red Concord coaches that would pull up to the post held up to nine people and were pulled by a set of four horses (Figure 2.14). Drivers were changed every 40 miles, and stock stations were located every 12 to 15 miles. Problems often arose on such stage coach lines due to the absence of regulations governing the conduct of the stage driver (Choitz 1967:10; Lee and Raynesford 1980). Circular No. 1, issued at neighboring Fort Zarah, pinpointed the difficulties faced by soldiers charged with escorting stages and issued regulations to alleviate these problems:

Frequent complaints having been made to these Hd. Qrs. against the drivers of the Mail Coaches in this District for their drunkenness and reckless exposure of the lives and property of the passengers confided to their charge. As the Commanding Officer of this District is held to a strict accountability for the safe passage through the limits of his Command of all travelers, so also will he hold the Commanders of the various Posts for the safety of the Mail Coaches and all trains that are under Escort from their Posts. Hereafter the Escorts will not travel at a faster rate than (5) five miles per hour. The Escort will be kept well closed up and no stragglings allowed. The Officer in Command will be held to a strict accountability for the safe delivery of the Coach or train at the next Post and also for the condition of the horses of his Escort. The Coach must keep with the Escort and travel as it travels and Officers in Charge of Escorts, being also in charge of Coach - should the driver fail to obey their instructions, they will arrest them and detail a man to drive the coach to the next station and these Head Quarters be notified immediately (NA 1864-1865: Circular No. 1, 15 March 1865).



Figure 2.14. Sketch of Butterfield Overland Despatch stagecoach. From *Harper's Weekly*, 21 April 1866. (Courtesy of Kansas State Historical Society).

The Butterfield Overland Despatch Company operated for less than 18 months. Reasons for its failure included the declining mining interest in Colorado and the frequent Indian hostilities at the stations west of Fort Ellsworth along the Smoky Hill Trail. Hostilities ranged from the stealing of horses to the burning of stations and killing of drivers. Several detachments from Fort Ellsworth were garrisoned at the stations to the west from 1865 to 1866. The line was sold to Ben Holladay in 1866. Holladay was the owner of the Overland Express Company, and he merged the two businesses to form the Holladay Overland Mail and Express Company. Holladay later sold the line to Wells Fargo in late 1866, who continued the service until the Union Pacific Railroad was completed in 1867 (Blackmar 1912:267; Choitz 1967:10; Lee and Raynesford 1980).

Another duty that the enlisted men at Fort Ellsworth were frequently charged with was guarding mail or stage stations along the roads. On 23 October 1866 a letter was written to Holladay outlining the measures that would be taken by the military to insure the safety of the coaches and mail route. The military would provide two to three horses, forage, two months worth of subsistence supplies, and ammunition at each mail station. In addition, three companies of infantry and two troops of cavalry would be stationed at Fort Ellsworth; and two infantry companies and one troop of cavalry would be stationed at Camp Fletcher, Fort Wallace, and Fort Morgan (Frederick 1940:228). A week later General Orders No. 6 from the District of Upper Arkansas was issued to Fort Ellsworth. This order detailed one sergeant and 20 privates of Company H, 3rd U.S. Infantry, and a corporal and four privates of Company G, 7th U.S. Cavalry, to proceed to the Lost Creek mail station. Another group consisting of one sergeant and 20 privates of Company E, 19th U.S. Infantry, was to proceed to the Fossil Creek mail station. Each detachment was to be supplied with a wagon, a month's supply of subsistence stores, a month's forage for the cavalry horses and mule team, and an ample supply of ammunition, tents, axes, spades, shovels, nails, and other carpentry tools. For shelter, the men were to build a stockade or redoubt as close as possible to water and trees. Their mission was to control and protect their designated road. The men were ordered not to interfere with employees and coaches of the mail companies and to not interact with any Indians that may be in the area. The detachments were to be relieved monthly, and reports were to be made to Fort Ellsworth as often as the mail passed. If there were not enough men enough available for duty in those companies, men on extra or daily duty were to be relieved to make the number specified (NA 1865-1869:Special Orders No. 177, 12 November 1866).

Many of the enlisted men at Fort Ellsworth were detailed on extra or daily duty. Post Orders No. 6 provides a list of the different types of positions and the number assigned to each on daily duty.

In order to properly arrange the details for guard, detached service, etc., the following non-commissioned officers and privates, and none others, may be reported as on daily duty: viz: - men detailed as Bakers; Hospital Attendants, including the Acting Hospital Steward; Tailors, actually employed in altering clothing; Herders, not exceeding three (3) from each Company of Cavalry; Company Cooks, not exceeding one to every thirty men; men on extra and daily duty in the Quartermaster and Commissary Departments. The Stable Police, not to exceed three (3) men from each

Company of Cavalry, while not reported on daily duty, will not be considered in the strength of Companies for duty, in making details for guards, etc. While building of quarters is progressing, each of the companies, except those men enumerated above, will be considered as a fatigue party, and will labor under the direction of the Commanding Officer of the Company (NA 1865-1869:Post Order No. 6, 23 June 1866).

Other types of positions included a company clerk, a butcher, strikers, farriers, and blacksmiths (NA 1865-1869:Special Order No. 69, 19 June 1866; NA 1865-1869:Post Order No. 6, 23 June 1866). Strikers were men detailed in officers' quarters to supply wood, maintain the structure, and assist at social gatherings. Alice Blackwood Baldwin mentioned strikers in her journal. Their striker's name was Joe Bowers, and on her first day at the post Joe "cleaned house . . . The rusty stove was blacked, the floor swept and order generally restored" (Baldwin 1928:122, 126-128).

Some men on daily duty enjoyed a slightly higher status and an increase in wages. Bakers were paid an additional \$8.00 per month, and the head baker was paid \$8.50 (NA 1865-1869:Council of Administration 30 June 1866; NA 1865-1869:Council of Administration, 2 January 1867). Mrs. Baldwin mentioned that strikers were paid more and were able to eat their meals in "warm and comfortable surroundings." Due to these privileges, she states that men willing to do the work were easy to come by (Baldwin 1928:127-129).

During the building of the fort in the latter half of 1866, there was a large number of detachments being ordered out on escorting and guarding missions. In the surviving orders and letters for the post, a sense of reluctance can be heard in the commanding officer's voice as he relieves men detailed in the building of the new fort to go on these missions. An order to furnish 10 men and one noncommissioned officer to escort hay contractors to Fort Fletcher was made in October of 1866. In order to comply with the order, the commanding officer at Fort Ellsworth was forced to relieve men working in the quarries (NA 1865-1869:J. Page to W. Harrison, 10 October 1866). As winter deepened that year, the escort missions became fewer. As a result, more men were detailed to manual labor in order to complete the post. Commanding Officer Alfred Gibbs wrote on 25 January 1867 that "All hands being employed in building stables, there is but little military duty besides Guard Mounting and Sunday Inspection. The Cavalry are particularly deficient many of them never having been taught even to mount; all are ignorant of the manual of arms, the cavalry never have drawn their sabres from the boxes. They would make a sorry figure in a conflict with Indians" (NA 1865-1869:A. Gibbs to H. Noyes, 25 January 1867).

One of the chief reasons for the high number of desertions at frontier military posts was the large amount of time spent doing manual labor (Knight 1978:163-171). At Fort Ellsworth, a total of 72 men were reported for desertion from October of 1864 to January 1867. The largest number in one month to desert was 14. That occurred in November of 1865, and they were members of Company I, 2nd U.S. Cavalry (NA 1865:Post Returns, October 1864 - January 1867).

After the calling of retreat, the men were free for the evening. Liesure time was spent in several different ways. John Morrill, a soldier who passed through Fort Ellsworth, noted in a 23 September 1865 letter to his wife and children some of the social activities that went on at the post while he was there.

we have just began to get into the buffalo country. have seen skulls & skeletons of them for two days but I have seen no live one to be near them. the Cols allows the boys to go hunting chicking [sic] & Buffalo as much as they please when in camp, or on the [sic] he will go with & frequently shoots at a stray chick while at the hed of the line or halts the Regt for some one else to shoot. the boys are out arround [sic] camp shooting all the time. Yesterday was the first day we have camped where there was any Buffalo & the Boys went out & killed 6. horsemen would ride up beside them & Shoot them with carbines or revolvers, the footman did not have much success but saw numerous Buffalo, Antelope & wolves... Well we have been laying arround camp all the afternoon have cooked & eaten our supper. Sam has gone to get some water & I am agoing to get some grass to make our bed. We did not march but 5 miles to day have to march to where we can find wood & water.. there is no camp gard. the men go & come when they please since we left Riley I had a piece of Buffalo which I broiled on a stick. it is sweet have some to cook for supper. it is sweet looks like beef but is reder [sic] (Morrill 1865).

The large number of native buffalo that occupied the ranges of the Smoky River was also commented on by Julian Fitch, surveyor for the Butterfield Overland Despatch in the summer of 1865. He commented that

Five miles west of Fort Ellsworth we were fairly in the Buffalo Range for miles in every direction as far as the eye could see the hills were black with those Shaggy monsters of the Prairie grazing quietly upon the finest pasture in the world. Should I estimate the number of Buffalo to be seen at one view at a million it would be thought an exaggeration but better authority than myself has estimated them at millions or as being greater in number than all the domestic cattle in America. Truly it has been said that the Smoky Hill is the garden spot and hunting ground of America (Fitch 1865).

Other liesurely pursuits included attending whatever social events that had been planned at the post or playing cards at the sutler's store. Some men also took the opportunity to indulge their tastes in liquor (Knight 1978:163-171). General Order No. 1, dated 11 January 1866, provides a glimpse into the liquor situation at the fort. The order by Brevet Major Green documented trouble occurring at the fort with regard to the sutler being able to sell liquor to citizens and train masters passing over the road. Green called attention to War Article No. 29, which stated that no sutler was permitted to sell any kind of liquor or victuals, or keep their stores or houses open past 9:00 p.m. or before reveille or on Sundays during church for the entertainment of soldiers. Green further prohibited the sutler from selling intoxicating liquor to any citizen or soldier connected with the army except upon an order approved by the Post Commander. Commissioned officers were excepted

in this order only when they presented themselves in person at the sutler's store. Their orders for liquor also had to be countersigned by the Commanding Officer of the post before being filled by the sutler (NA 1865-1869:General Order No. 1, 11 January 1866).

The military's authority in preventing the consumption of liquor, however, did not as easily extend to places outside of the post. In a letter written to Kansas Governor Crawford on 3 September 1866, Commanding Officer John H. Page complained about the "Whiskey Ranches" located between Salina and Fort Ellsworth. Page stated, "My soldiers are continually drunk, these Ranchmen selling and giving them liquor on credit. As I interpret the Law this is Indian Country and it is my duty to destroy all spirituous liquor brought into it." Page requested information on whether it was illegal for ranchmen to sell liquor without a license beyond Salina. As further justification for his concern, Page noted that it was through the ranchmen that the Indians were receiving liquor and the teamsters of passing trains were becoming intoxicated. Page concluded by stating that "The evil is increasing every day"(NA 1865-1869:J. Page to Governor Crawford, 3 September 1866).

Measures had actually been taken on 25 August 1866 to halt a neighboring settler from selling liquor to enlisted men and government employees. The settler was located five miles to the east of Fort Ellsworth, and an armed detail of two men and one noncommissioned officer was assigned to guard his establishment. At the same time, the post sutler was ordered to not sell more than two glasses of liquor a day to enlisted men or government employees at the post (NA 1865-1869:Special Order No. 124, 25 August 1866).

Soldiers who were under the influence of alcohol often got into trouble. The case of Hospital Steward John Lumb shows the lengths some soldiers went to indulge their taste. Lumb was arrested and confined for stealing liquor from the hospital. On 15 August 1866 the commanding officer wrote that "[Lumb] is one of those obstinate, insubordinate characters who are a nuisance to the service, and when he is drunk on Hospital liquor, he becomes so bad that it is necessary to place him in close confinement. He is now confined to his tent, for, while in arrest, d[rag]ging the Acting Hospital Steward away from the Hospital, and then robbing it of a quantity of Hospital Brandy" (NA 1865-1869:I. Palmer to L. Thomas, 15 August 1866).

Those soldiers that were arrested for such offenses were tried at garrison courts-martial. One such court-martial arraigned and tried two soldiers. The first, Corporal Francis Henebry of the 13th Infantry, was charged with "Drunkenness [*sic*] on duty" and "Conduct to the prejudice of good order and military discipline." The incident occurred while escorting the U.S. Paymaster to Fort Riley, Kansas. Henebry pleaded guilty to the first charge and not guilty to the second. Henebry was sentenced to be "reduced to the ranks, to be confined at hard labor in charge of the guard for one month, wearing a ball and chain weighing twenty (20) pounds attached to his right leg, and to forfeit to the United States sixteen (16) dollars of his monthly pay for one month." The second soldier, Private Burk of the 13th U.S. Infantry, was charged with "Drunkenness [*sic*] on duty." The incident occurred while on duty with a party sent from the post to pursue deserters. At the town of Salina, the soldier became "so much under the influence of intoxicating liquor as to be unable to perform any duty whatever." The soldier pleaded not guilty, but was found guilty and charged to be confined at

hard labor in charge of the guard for one month, with a ball and chain weighing 20 pounds attached to his right leg, and to pay the United States eight dollars out of his monthly pay. However, the proceedings of the court following the sentencing took into consideration the soldiers' character and recommendations of members of the court, and remitted the wearing of a ball and chain for both soldiers (NA 1865-1869:General Orders No. 4, 1 March 1866).

Encounters with Native Americans

As presented earlier, Fort Ellsworth was established in June of 1864 in reaction to raiding bands of Cheyenne and Sioux in the vicinity of the Smoky Hill Crossing. Thus the purpose of Fort Ellsworth was to protect the settlers, wagon trains, and mail and stage stations along the Fort Riley/Fort Larned Road and Smoky Hill Trail from these hostile forces. From 1864 to 1866, the troops stationed at Fort Ellsworth encountered Indians numerous times in the course of their duties.

It was not very long after the establishment of Fort Ellsworth that the soldiers garrisoned there came into contact with Indians. On 7 August 1864 a raiding party struck Fort Ellsworth. Forty to fifty horses belonging to the 7th Iowa Volunteer Cavalry and five mules belonging to the Kansas Stage Company were stolen. Although Captain Booth and 20 men of the 7th Iowa pursued the Indians for 40 miles up the Saline River, they were unable to catch them (U.S. War Department 1893, 41[1]:233). Soon after that event, a detachment under Lieutenant Ellsworth joined with the 11th Kansas Cavalry from Fort Larned to trail a band of Indians in the area. However, no engagements took place due to the Indians numbering around 600 and the cavalry totaling 92 (Mattes 1947:1).

A fatal encounter with the Indians occurred on 16 August 1864. In a diary entry dated 17 August 1864 the Reverend A. A. Morrison noted that "News has come that four soldiers have been killed between here and the Smoky Hill Crossing west of us" (Salina Public Library [SPL] 1863-1917). He was referring to the engagement that occurred the day before when six men of Company H, 7th Iowa Volunteer Cavalry, left Salina en route to Fort Ellsworth. They were attacked by 100 to 300 Indians at Elm Creek. It was reported that the soldiers had used up all of their allotted ammunition hunting buffalo, so they were defenseless against the surprise attack. They were quickly overtaken and scalped before reaching Fort Ellsworth (Shoaf 1938:6; U.S. War Department 1893, 41(1):264). The Indians that murdered the soldiers may have been part of the group mentioned in a 15 August 1864 letter to Lieutenant Ellsworth. The letter stated that a large group of Indians were moving southwest from the Fort Kearny and Denver road to the Little Blue and Republican rivers. The Indians were transporting a large herd of oxen, horses, and mules that they had captured on the Kearny road. Ellsworth was directed to send scouts in the direction of the Republican River to watch their movements, as they were expected to head for the Arkansas River (U.S. War Department 1893, 41(2):721).

Compared to August, the remainder of the year was fairly quiet. Only two incidents were recorded. On 4 December 1864 Indians attacked an ordnance train on Cow Creek, which is located to the west of Fort Ellsworth. The driver of the train was killed, but the escorts were able to escape

to Fort Ellsworth (U.S. War Department 1893, 41(1):981). On the same day, three horses were reported taken by Indians at Clear Creek Crossing (NA 1965:Post Return, December 1864).

The only report of Indian contact for the year of 1865 occurred during the month of June. On the 17th it was reported that several forts along the Santa Fe Trail and the Fort Riley/Fort Larned Road were attacked by Indians. Those forts included Dodge, Larned, Zarah, and Ellsworth (U.S. War Department 1893, 48(2):914). Unfortunately, no details were given regarding this attack.

In 1866 the Indians began to increase their resistance against the military and white settlers living in central Kansas. The main focus of their attacks tended to be the mail and stage stations located to the west of Fort Ellsworth. Figure 2.15 illustrates the road and the locations of several of the stations that were the object of Indian attacks. Another major occurrence at Fort Ellsworth that year was the meeting between the chiefs of the Cheyenne and Arapahoe nations with Commanding Officer I. N. Palmer and Indian Agent Wynkoop.

The first reported Indian hostility occurred in May of 1866. Mr. Reynolds, the general superintendent of the Holladay Overland Mail and Express Company, reported to Commanding Officer John Green that the Indians were stirring up trouble between Fort Ellsworth and Fort Fletcher on the Smoky Hill Trail. He also reported that they had burned the station at Lost Creek after the men of the Holladay company left it. Although no one had been injured, the Holladay company wished to increase the security of the stages and the road. They requested that Green detail four men to Lost Creek and four men to Big Creek stations, as well as sending an escort of four men on each coach between Fort Ellsworth and Fort Fletcher (Figure 2.15). Green promised to do so until further orders were received from headquarters (NA 1865-1869:J. Green to S. Mackey, 17 May 1866).

The next major occurrence in 1866 was a meeting between Indian Agent Wynkoop, Commanding Officer I. N. Palmer, and the chiefs of the Cheyenne and Arapaho nations. According to one published account, the chiefs included Black Kettle, Roman Nose, and Big Head. The men gathered for the meeting near the Smoky Hill River. Reportedly, two hospital tents were set up at the site, one being for the Indians and one for the officers. Large quantities of beef, coffee, sugar, and bread were provided for the visitors, and after a day of rest, the meeting took place. The Indians were requesting that the construction of the railroad across their hunting grounds be stopped. The railroad construction and buffalo hunters were driving away their primary food source. If the construction was stopped, they promised to restrain the young Indian men from attacking the railroad and settlers (Fry 1879:18-25).

However, another account written by Palmer told a different story of the meeting. On 14 August 1866 a meeting was held between the Indian Commissioner, Black Kettle, Big Head, and

others of the Cheyenne Nation. The Indians requested that Palmer write a letter to the commanding officer of Fort Kearny asking him to deliver a message to the Pawnee nation. The message was to state that the Cheyenne were willing to make peace with the Pawnees. If the Pawnees were agreeable to this, they were to meet them somewhere on Big Creek or in the vicinity of Fort Ellsworth. They wished the Pawnees to bring with them two medicine arrows belonging to the Cheyennes that were currently in their possession. If the Pawnees brought the arrows with them, the Cheyennes would accept that as a sign of the peace from the Pawnees and would supply the Pawnees with horses and take them back to the Cheyenne villages for a celebration. The Pawnees were to signalize their approach by making fires on the prairies as they advanced. Palmer stated in the letter he duly forwarded to the commanding officer at Fort Kearny that he regarded the measure of peace as highly important and urged the commander to take the same consideration (NA 1865-1869:I. Palmer to Commanding Officer, Fort Kearny, 15 August 1866). A third account states that during this meeting Major Wynkoop attempted to convince the Indians to accept the treaty of 1865, which ceded the Republican and Smoky Hill lands. However, it was recorded that the attempt failed (Grinnell 1956:246).

Whatever the outcome of the meeting held in August, Indian hostilities appear to have resumed in October of 1866. In a letter to the commanding officer at Fort Wallace, dated 1 October 1866, John Page stated that on 29th September two stock tenders were shot at Chalk Bluff Station (Figure 2.15). This station was located between Fort Fletcher and Fort Wallace on the Smoky Hill Trail (NA 1865-1869:J. Page to Commanding Officer, Fort Wallace, 1 October 1866). A little over two weeks later 80 Indians attacked Chalk Bluff station again and drove away the stock tenders before setting fire to the hay barn (NA 1865-1869:J. Page to W. Harrison, 15 October 1866).

On a slightly different note, Commanding Officer Daingerfield Parker wrote to headquarters in early November requesting authority to issue rations to destitute Indians. He had been informed that a verbal understanding had existed at the post between the Indians and the military concerning the occasional supply of rations to the Indians (NA 1865-1869:D. Parker to Chauncey McKeever, 5 November 1866). This policy stands in contrast to the personal opinions of some of the commanding officers at Fort Ellsworth. Brevet Major General Alfred Gibbs, who would command Fort Harker from January to March of 1867, stopped at Fort Ellsworth in mid-November and related his personal opinions on the situation with the Indians as follows:

With regard to the accomplishments of the object of my late expedition, I have to say that I carried out my instructions to the letter, despite my own judgement. The Indian Commissioner and Major Wynkoop were determined to pay the Cheyennes their annuities without insisting upon the delivery of the murderer of Colonel Bent's Mexican guide on the 2nd instant as Major Wynkoop stated both to me and Liet. McElroy 2nd Cavalry. I most anxiously desired to arrest "Roman Nose," the most audacious and hostile young chief of the Cheyennes, who frequently came round my camps as a hostage for the return of the murderer, but I could not do so in accordance with my instructions and not being on an Indian war of some dimension although my first view would have been annihilation to the Cheyenne Nation. It is impossible to

make these Indian tribes comprehend their relations to the whites so long as irresponsible Indian Agents stand between them and the Military (NA 1865-1869:A. Gibbs to General [?], 19 November 1866).

That same day Gibbs received a report from Bradley, the guide at Fort Ellsworth, concerning the kidnapping of some white children. Gibbs repeated Bradley's intelligence in a letter directed to General G. A. Custer. Gibbs wrote that the white boy captured by the Comanches had been returned, but the girl had escaped and nothing was known about the fate of the elder boy. Gibbs concluded by stating "All is quiet on the Smoky Hill" (NA 1865-1869:A. Gibbs to G. A. Custer, 19 November 1866).

Supply of the Fort

Being located 35 miles from Salina, the closest town, the officers, enlisted men, and civilians of Fort Ellsworth were very limited in the number of sources they could turn to for material goods. The three locations available to them were the sutler's store, quartermaster department, and commissary department. Although there was not a large selection of goods to choose from, these places provided for all of the basic needs of the fort. Chief among these needs were food, clothing, arms, and miscellaneous equipage.

Food at Fort Ellsworth was provided through the commissary department, the post bakery, the sutler's store, and through hunting and fishing. The commissary department supplied the soldiers' rations. Pork, bacon, beef, flour, beans, bread, coffee, and other articles of produce constituted the foundation of rations at frontier military posts (Rickey 1963:118). The daily ration for one person was fixed by Army regulation.

Twelve ounces of pork or bacon, or canned beef (fresh or corned), or one pound and four ounces of fresh beef, or twenty ounces of salt beef; eighteen ounces of soft bread or flour, or sixteen ounces of hard bread, or one pound and four ounces of corn meal; and to have, every one hundred rations, fifteen pounds of peas or beans, or ten pounds of rice or hominy; ten pounds of green coffee, or eight of roasted (or roasted and ground) coffee, or two pounds of tea; fifteen pounds of sugar; four quarts of vinegar; four pounds of soap; four pounds of salt; four ounces of pepper; one pound and eight ounces of adamantine or star candles; and to troops in the field, when necessary, four pounds of yeast powder to one hundred rations of flour (Quoted in Ziegler 1996:19).

No document has been found that details what goods the commissary department at Fort Ellsworth offered and where the goods were purchased or received from. However, the records of the post councils of administration do detail the goods purchased from the commissary with post funds. On 6 June 1866 the items on a commissary bill dated 30 June 1866 were recorded. The items included two pounds of bacon, eight pounds of candles, 87 pounds of salt, and 17 bushels of potatoes (NA 1865-1869:Council of Administration, 30 June 1866). A commissary bill issued to the post for

the months of November and December 1866 specified the purchase of six pounds of candles, 73 pounds of salt, two pounds of bacon, four and a half bushels of potatoes, three brooms, three pounds of hops, one padlock, two bottles of ink, and pan holders (NA 1865-1869:Council of Administration, 2 January 1867). A 31 August 1866 council of administration specified that the salt, candles, and potatoes purchased from the commissary with post funds were for the bakery (NA 1865-1869:Council of Administration, 30 August 1866).

Officers' families were subject to eating the same food as the enlisted men. Alice Blackwood Baldwin, however, did not seem to think that was a problem as "There was always plenty in the commissary to supply the table" (Baldwin 1928:129). At some posts it was common to have a wagon make a regular trip to the nearest town for extra supplies or for local farmers to regularly supply fresh produce, although such cases have not been documented at Fort Ellsworth (Knight 1978:129).

By 1866 commissary departments were selling special food items such as canned fruits, canned butter, onions, potatoes, oysters, pickles, spices, and other sundries. This practice, however, raised the competition, and thus the prices, between the post sutler and the commissary (Rickey 1963:118).

The food offered by the post commissary was often of poor quality. As it was usually transported from posts located more than a hundred miles to the east, the risks of spoilage due to the length of exposure was high. Spoilage was also caused due to improper storage. Salt pork could become rancid, while flour and other poorly packaged foods provided feasts to worms and insects. The condition of the buildings in which they were stored affected the quality of the food as well. The log shanties and dugouts with brush and mud roofs at Fort Ellsworth were very detrimental to the storage of commissary and quartermaster supplies, especially during seasons of warm, wet weather (Oliva 1980:45, 1982:63). On 9 April 1866 Commanding Officer Kilburn Knox requested an examination into and a report on the condition of the stores delivered from Fort Zarah. He described the commissary stores as being in a "most miserable state" and over three-fourths of them were totally unfit for issue (NA 1865-1869:K. Knox to R. Torrey, 9 April 1866).

Fort Ellsworth operated its own bakery. Two to three enlisted men were detailed as bakers at the post. The daily issue was estimated to be at 250 loaves. The bakery was used for profit, as well as for supplying the needs of the soldiers. One of the main forms of income at the post was the sale of bread baked at the post bakery. A ration of bread sold to citizens cost 12 cents. The proceeds, after the payment of commissary and sutler bills, were divided among the regiments (NA 1865-1869:Council of Administration, 30 June 1866). The post received \$106.00 from the sale of bread and flour during the months of November and December 1866 (NA 1865-1869:Council of Administration, 2 January 1867; NA 1865-1869:A. Gibbs to M. Morgan, 7 February 1867).

John Morrill wrote from Fort Larned on 28 October 1865 about the bakery located at that post:

I get my Bread at the Bakers there was an oven built here for a beakery [sic] & had been used so they found a beaker in each of our two companies & detailed them to bake & they bake the best bread I have seen since we have been out. Well I do not use quit [sic] all my rations of Bread as I have rice & other thing that serves to lessen the required amt of Bread. I go to the shop & draw flour when I do not want Bread. Well what next I will tell you as fast as I can. I have a little cook Stove in my room. sometime you might see me beaking pancakes & Sitting by the stove eating them. sometimes baking Sweet cake sometimes cooking meat & Tea & So on. I design to make me a Short Cake for supper (Morrill 1865).

Foods that were not available at the commissary could be purchased at cost at the sutler's store. On 16 December 1865 Ephraim Warner, Esquire, was approved and recommended for the position of post sutler by a council of administration held at Fort Ellsworth (NA 1865-1869: Council of Administration, 16 December 1865). According to General Order No. 3, dated 5 December 1865, the Sutler's Store was opened to the enlisted men on Monday through Saturday from 9:00 a.m. to retreat. Sales prior to 9:00 a.m. were strictly prohibited (NA 1865-1869: General Order No. 3, 5 December 1865).

A council of administration held the following February examined "the Post Sutler's books, papers, and stock of goods, and found them to be requisite [for] the wants and requirements of the military service." The sutler was taxed on a monthly basis at 10 cents per man. In February of 1866 this totaled to \$20.00. The tax provided the second form of income for the post, which also went toward the payment of post bills and distribution to the regiments (NA 1865-1869: Council of Administration, 28 February 1866).

A council of administration held on 30 June 1866 examined the stock kept by Post Sutler Ephraim Warner and approved the prices set for the goods. The council directed that a list of the prices be posted in an obvious location in the store. The goods and prices for 30 June 1866 are provided in Table 2.2. A second listing of goods and prices for the Fort Ellsworth sutler's store was recorded in the 25 November 1866 post council of administration records. When setting the prices, the council took into consideration the original cost and the cost of transportation. This list is provided in Table 2.3.

Goods were also purchased at the sutler's store with post funds. A sutler's bill dated 30 June 1866 specified that the post had purchased the following: four pounds of hops, mooving [sic] logs, one dipper, two blank books, one bottle of ink, one pencil, 10 bake pans, freight to Express Co., garden seeds, and one box of matches (NA 1865-1869: Council of Administration, 30 June 1866). Miscellaneous articles specified to be purchased with post funds included a \$10.00 clock for the adjutant's office; newspaper subscriptions to *Harper's Weekly*, *Frank Leslie's Monthly*, *Army and Navy Journal*, *St. Louis Democrat*, and *New York Weekly Tribune*; and "standard works for the founding of a Post Library" (NA 1865-1869: Council of Administration, 30 April 1866; NA 1865-1869: Council of Administration, 30 October 1866; NA 1865-1869: Council of Administration, 2 January 1867).

GOODS	PRICES	GOODS	PRICES
Chewing Tobacco pr lb	1.50	Black Linen Thread pr Skein	0.10
Smoking Tobacco pr lb	1.00	White Button Gloves	0.25
Can fruit & Oysters pr Can	1.00	Military Caps	3.00
Can Tomatoes	0.75	Military Hats	4.00
Can Meat	1.00	Sweet Armor Oil pr Bottle	0.25
Can Milk condensed	0.75	Fork [?] pr Bottle	0.15
Paper pr Quire	0.40	Matches pr Box	0.15
Yeast Powder pr Can	0.50	Combs coarse & fine	.30 & 1.25
Tripoli pr Package	0.20	Hair Brushes	1.00
Envelopes pr Package	0.20	Brafs [sic] Brushes	0.25
Steel Pens pr Doz	0.30	Cloth Brushes	1.00
Tooth Brushes	.50 & 1.00	Pocket Hnkfs [Handkerchiefs]	.25 & 1.50
Blacking pr Box	.15 & .25	Towels	.50 & .75
Paper Collars	0.50	Cravats	.75 & 1.00
Pocket Knives	1.50 & 4.50	Pocket Books	1.00 & 2.00
Spoons	0.15	Boots	6.00 & 13.00
Table Knives & Forks pr Set	2.50	Shoes	2.00 & 5.00
Tin Cups	.20 & .25	Port folios	.50 & 1.00
Tin Plates	.20 & .25		
Wash Pans	0.75		

Table 2.2. Sutler's List, Fort Ellsworth, 30 June 1866

GOODS	PRICES	GOODS	PRICES
Blacking (large)	0.15	Collars paper p box of 10	.30 & .50
Blacking Small	0.08	Caps Mill.	3.00
Button Brushes	0.25	Hats Mill.	4.00
Blacking Brushes	.40 & .75	Canned fruits & oysters p can	1.00
Clothes Brushes	0.60	Tomattoes [sic]	0.75
Bath Brick	0.25	Tripoli pkg	0.10
Shaving Boxes	0.15	Can. Meals	1.00
Pocket Books	1.25 & 1.75	Sweet Oil	0.20
Boots	6.00 & 13.00	Matches	0.05
Buckets	0.55	Brushes Shaving	.15 & .75
Candles	0.50	Buttons	
Cheese	0.50		
Crackers	0.30		
Combs	.15 & .75		
Cups	0.25	Brushes Tooth	.25 & .50
Envelopes	.10 & .40	Tin Plate	.20 & .25
Gloves White	.25 & .30	Wash Pans	0.75
Gherkins Pickles	1.00 & 1.25	Linen & Cotton Pocket Handks.	.40 & 1.00
Honey	0.75	Blk Silk Neckerchiefs	2.75
Knives & Forks (Set)	2.20	Towells [sic]	0.60
Cond. Milk Can	0.75	Shoes	
Needles p doz	0.05	Port Folio	0.50
Nutts [sic]	.50 & .80	Soap	.10 & .40
Paper Note p Quire	.25 & .30	Sewing Silk per Skein	0.10
Paper Letter p Quire	.40 & .50	Buck Gloves	1.50 & 5.00
Emery paper p Sheet	0.05		
Pens p doz	0.25		
Tobacco Smoking p lb	.75 & 2.40		
Tobacco Chewing p lb	1.00 & 2.50		
Fine Cut in papers	0.15		
Tea per lb	2.20 & 3.25		
Tacks paper (per paper)	0.15		
Suspender per pair	.80 & 1.00		
Vests Mill. each	5.00		
Whiskey per Gallon	5.50 & 10.00		
Linen Thread per Skein	0.10		

Table 2.3. Sutler's List, Fort Ellsworth, 25 November 1866.

An 1863 sutler's list from Fort Larned provides a good basis for comparison to what was available at Fort Ellsworth. Examples of foods available for purchase there included potatoes, apples, flour, canned tomatoes, canned peaches, canned oysters, eggs, catsup, chocolate, coffee, tea, beer, and whiskey (Oliva 1982:58). Nonfood goods available in 1863 included castor oil, cologne, blue jeans, canvas, blankets, chewing tobacco, soap, playing cards, diaper pins, neckties, candles, wash boards, hoop skirts, lead pencils, smoking pipes, songbooks, fishhooks, coffee pots, guitar strings, saddles, lanterns, Epsom salt, cloth, pots and pans, hats, matches, needles and thread, nails, revolvers, buttons, sulfur, hair dye, turpentine, wallets, tin buckets, axes, padlocks, scissors, mirrors, beads, and horse liniment (Oliva 1982:58).

At Fort Hays in 1867 the items available for sale included Tripoli, sweet oil, shaving brushes, emery paper, butcher knives, shoe brushes, Uncle Ned Smoking Tobacco, Cherokee, Davy Crocket, Montana, Navy Chewing, grape juice, Peerlees, Beauty, Guilt Edge, Fine Cut, candles, fancy soap, palm, cheese, butter, yeast powder, starch, tooth brushes, whiskey, chow chow, prepared mustard, blacking, white cotton gloves, sheep skin gloves, combs, pocket combs, zinc mirrors, pint pickles ink boxes, matches, picnic crackers, butter crackers, sugar, ginger snaps, tin cups, tin plates, knife and fork, spoon, chalk, cream tartar, clothes brushes, and castile soap (NA 1867-1874: Council of Administration, 8 January 1867).

Far cheaper foods were available at the front doors of the dugouts and log shanties at Fort Ellsworth. Hunting, fishing, and gardening provided an abundance of fresh meat and produce, especially when in the field on escort duty. "The field appetite is a wondrous sauce, and soldier coffee with bacon, beans, 'Dutch oven' bread, and antelope steak have a relish in the keen October air known only to the frontiersman" (Knight 1978:215). Types of animals used for meals included buffalo, deer, elk, antelope, fish, grouse, pheasant, and wild turkey (Utley 1984:86). John Morrill, in his 23 September 1865 letter to his wife and children, mentioned the hunting of buffaloes and chickens surrounding Fort Ellsworth. He also described a method of preparing the buffalo meat: "I had a piece of Buffalo which I broiled on a stick" (Morrill 1865). Alice Blackwood Baldwin recorded in her journal that the foods from the commissary store were "augmented frequently by game given by some wandering and venturous hunters" (Baldwin 1928:129).

Garden seeds were included on a sutler's bill presented to a post council of administration in June of 1866. This suggests that the post kept a garden for either the officers, enlisted men, or post bakery (NA 1865-1869: Council of Administration, 30 June 1866). Other natural foods that were used in the preparation of meals included wild garlic, lamb's quarters, and wild onions (Rickey 1963:120; Utley 1984:87). Sometimes officers' families also kept chickens, pigs, and milk cows (Caperton and Fry 1980:32).

All of these different types of foods, when combined together, provided replenishing, nutritious meals. For breakfast one Sunday morning at Fort Larned on 12 November 1865, John Morrill had boiled potatoes, good smoked shoulder, bread, tea, and doughnuts. In his pantry he kept flour, rice, sugar, molasses, and bacon. He also received rations of fresh beef every two days (Morrill

1865). Alice Blackwood Baldwin described some of the meals that were prepared at Fort Ellsworth. At one dinner party she watched as the hostess "deftly fried ham, baked the potatoes, stewed the tomatoes in their can in a kettle of hot water, then opened the can and seasoned them, pouring them into a soup toureen." (Baldwin 1928:129-130). For their first breakfast cooked and served in their dugout, the Baldwins ate fried bacon and apples, stewed peaches, a "concoction flavored with onions," coffee, and "butterless toast of soldiers' bread" (Baldwin 1928:125). Other foods mentioned by Mrs. Baldwin include cove-oyster patties and broiled steaks (Baldwin 1928:128-130). An account from a traveler on the Butterfield stage line in 1865 described taking a meal of venison, baked potatoes, corn dodgers, and coffee at Fort Ellsworth (Frederick 1940:246).

Both the quartermaster department and the sutler's store provided clothing to soldiers and citizens. The prescribed uniform for the frontier soldier has been described as follows:

Their great coats were rolled and strapped at the pommel, covered by a poncho. Blanket and sidelines were strapped behind the cantle, while the lariat and picket pin were fastened on the left side of the pommel with the canteen on the right. Saddlebags contained extra horseshoes, nails, socks, underwear, brushes, and combs for grooming the horse, and ammunition. The broad carbine sling rested over the left shoulder, with the muzzle of the weapon thrust into a socket on the right side of the saddle. . . . Buckskin gauntlets set off the blue flannel shirt and blouse (Knight 1978:198-199).

The required clothing for the different types of regiments that served at the post were not always available. On one occasion in December of 1865 the post quartermaster ran out of infantry clothing. The quartermaster requisitioned the chief quartermaster at Fort Leavenworth, the main supply depot, for six month's worth of infantry clothing. In the meantime, however, the soldiers made due with cavalry clothing (NA 1865-1869:Special Orders No. 3, 5 December 1865).

Fort Ellsworth supplied other detachments with items of clothing as well. Mr. George Wickes, the engineer in charge of the survey for the Union Pacific Railroad west of Fort Ellsworth, requested to be furnished with rations of clothing for his party until his own supplies arrived. The commanding officer at Fort Ellsworth complied and sent receipt rolls to Wickes in order to list the specific sizes and amounts needed for each soldier (NA 1865-1869:J. Page to W. Harrison, [1 October 1866]; NA 1865-1869:D. Parker to Mr. Wickes, 17 November 1866).

Discarded buttons off of old clothing were often used to make rings during this time at frontier posts. John Morrill wrote to his wife on 16 October 1865 that he "found an old black button the other day when I was out running arround [*sic*] & so I made you a ring. it is not a verry [*sic*] good one. I finished it off this evening & it is not verry good. I will sent it to you, & you can hav [*sic*] it" (Morrill 1865).

Arms and ammunition were supplied by the government primarily through the ordnance department. The earliest documentation of the types of ammunition used at Fort Ellsworth comes

from a letter directed to the commanding officer at Fort Zarah dated 13 March 1865. It read: "I wish that you could send me one (1) Box of Stars Carbine Cartridges and one Box of Stars Revolver Cartridges for the use of Co. "H" 2nd Colorado Cavalry. They being entirely out and I will return the same" (NA 1864-1865:C. Clark to Commanding Officer at Ft. Zarah, 13 March 1865). A 18 February 1867 circular from the District of the Upper Arkansas required a detailing of the amount of ammunition in the hands of the companies garrisoned at Fort Ellsworth. The types of small arms cartridges that were reported include "Rifled Musket Elongated Ball, Cal. 58; Spencer Rifle Elongated Ball, Cal. 54; Remington Pistol Elongated Ball, Cal. 44; and Colt Pistol Elongated Ball, Cal. 44" (NA 1865-1869:Consolidated Report, 26 February 1867). Another letter detailed the types of arms used. The regiments were directed on 8 March 1867 to box up all of their Springfield rifles, ammunition accoutrements, and appendages and turn them in to the post quartermaster for transportation to Fort Leavenworth when the new arms arrive (NA 1865-1869:Post Orders No. 10, 8 March 1867).

Both arms and ammunition were often in short supply at Fort Ellsworth throughout its existence. Post Orders No. 9 specified that each commanding officer in the District of Upper Arkansas was to keep on hand 300 rounds of ammunition per man. Also, when the companies changed their stations, they were to take this supply of ammunition with them (NA 1865-1869:Post Orders No. 9, 7 March 1867). Supplies of arms and ammunition ran low the most during times when heavy details of soldiers were leaving the fort on escort or guard duties. In a 3 September 1866 letter it was stated that "It took every pistol, carbine and saddle at this Post to arm and equip this detachment so that the portions of the Cavalry Companies remaining are entirely without arms and horse equipments" (NA 1865-1869:I. Palmer to W. Harrison, 3 September 1866; NA 1865-1869:I. Palmer to W. Harrison, 4 September 1866). Requisitions were frequently made to Fort Leavenworth for good supplies of carbine and musket ammunition over the years (NA 1865-1869:A. Gibbs to H. Noyes, 25 January 1867).

A final need supplied by the quartermaster was miscellaneous equipage. The quartermaster was in charge of providing to military personnel items such as forage for animals, transportation equipment, wood for fuel and furniture, and other items such as Sibley tents and stoves (NA 1865-1869:Special Orders No. 9, 9 January 1867; Welty 1938:166).

When the 2nd U.S. Cavalry arrived at Fort Ellsworth in December of 1865, they discovered the post to be entirely destitute of corn and oats to feed the regiment horses and mules. Unable to wait for replacement supplies to arrive from other forts, the quartermaster proceeded to Salina, which was 35 miles to the east, to purchase all that he could find to feed the animals for at least thirty days (NA 1865-1869:Special Orders No. 3, 5 December 1865). The same situation occurred again in March of 1867. Salina appears to have been the closest supply for such goods (NA 1865-1869:Post Order No. 8, 2 March 1867). Another item of forage required for the government horses and mules was hay. In addition to the quartermaster's hay yard, government contracts were often given to neighboring civilians for their hay (NA 1865-1869:F. de Courcy to J. Jacobs, 3 December 1865).

Special Order No. 170, dated 5 November 1866, provides a detailed listing of the many different types of transportation equipment under the control of the quartermaster. In the order Lieutenant Stanley A. Brown, 3rd U.S. Infantry and acting assistant quartermaster at Fort Ellsworth, was specified to turn over to the acting assistant quartermaster at Fort Fletcher the following quartermaster stores:

Six U.S. Mules, Six Harness Complete, one Army Wagon, Two Wagon Covers, One Wagon Whip, Six Wagon Bows, One Wagon Saddle, One Fifth Chain, One Spr[ader] Chain, Two Breast Chains, One Jockey Stick, Six Singletrees, One Doubletree, One Bearing Chain, Six Halter Chains, Six Neck Straps, One Tar bucket, One Water Bucket, One Lead Line, Six Lariats, Six Picket Pins, Twenty Axes, Five Spades, Five Pick Axes, One Cross Cut Saw, One Broad Axe, Six Hatchet And Handles, Twelve Axe Handles, One Set Saddlers Tools, One Clamp (NA 1865-1869:Special Order No. 170, 5 November 1866).

On 25 April 1866 a public auction was held at Fort Ellsworth to sell some pieces of condemned quartermaster property. The auction was advertized by written posters in all public places within 100 miles of the post. Two of the items that were included were wagons and harnesses. It was stated that "The wagons were old and entirely unfit for use, it was impossible to make one passably good wagon from the entire lot. The harness was entirely worthless and not fit for anything but old leather. The rest of the property was good for nothing. In fact the whole of the property was so worthless that the Inspector could not recommend that any of it be 'turned in for repairs'" (NA 1794-1915:K. Knox to M. Heigs, 8 August 1866).

Wood was a very important commodity to the citizens of Fort Ellsworth. Although trees lined the banks of the Smoky Hill River, the wood was primarily cottonwood, which is very soft. On 18 January 1867 a request was issued to double the wood allotted to the post. As it was winter and the new post was still being constructed, the wood at the post was quickly running out. It was reported that "The Hospital, Companies of Troops, Staff Offices, and Officers have all exhausted their allowance of wood for three or four days past. There is no possibility of purchasing any in this vicinity and I do not think it is the intention of the Government to expose its servants to the inclemency of the winter with the most insufficient shelter and supply of fuel entirely too limited to keep them comfortably warm" (NA 1865-1869:A. Gibbs to General [?], 18 January 1867). On at least one occasion, wood was obtained from Salina. Acting Quartermaster Sergeant James Cantwell of Company F, 2nd Cavalry, was ordered to proceed with three government teams to Salina to procure lumber belonging to the quartermaster department that was in the possession of a Dr. Lull (NA 1865-1869:Special Order No. 19, 15 March 1866).

The wood was used not only for fuel, but also to make furniture for the post. At posts supplied only by wagon train, cabinetmaking was another task delegated to post quartermasters. Due to the lack of wood, however, furniture was most often assembled out of dismantled crates and scrap lumber (Knight 1978:121). An order was issued on 8 July 1866 to the quartermaster at Fort Ellsworth to construct a table for the guardhouse. The table was to have a drawer large enough to

contain the Post Guard Report Book (NA 1865-1869:Special Orders No. 85, 8 July 1866). Alice Blackwood Baldwin described some of the furniture provided in her dugout quarters at the post during the winter of 1866-1867. The "top of a box served as a table" in her drawing room. In the commanding officer's quarters two low trestles with boards placed across them and a straw tick or mattress served as a couch (Baldwin 1928:125, 127).

Conclusion

Although Fort Ellsworth only existed for a short amount of time, its history is very important. The period from 1864 to 1866 was a complex one in Kansas history, as it preceded the coming of the railroad and the subsequent Indian battles of the late 1860s and 1870s. Due to its central location on two heavily traveled roads, Fort Ellsworth was a highly visible post. In the beginning, it was a simple blockhouse erected to protect the neighboring settlers and the military roads. However, by late 1866, it was the site of a council between the leading chiefs of the Cheyenne and Arapaho nations and was home to some of the most famous regiments and characters in western history. The primary documents and sources that exist for Fort Ellsworth illustrate all of the trials of frontier military life, from the crude living quarters to the lack of fuel in winter. Yet they also provide glimpses of the beauty of the Smoky Hills and the sense of community that prevailed among the men and women of the post. Although the history of some of the larger and more famous posts in Kansas outshine the history of Fort Ellsworth, the very characteristics of its size and its length of occupation allow for a more detailed and thorough dissection into the heart of the post: the men and women who lived there.

CHAPTER 3

ARCHAEOLOGICAL INVESTIGATIONS

by
Robert J. Ziegler

Research conducted during this study confirmed the presence of physical remains of Fort Ellsworth at Locality 6. Documentary and archaeological research leading to that conclusion is presented first in this chapter. The remainder of the chapter details the metal-detector surveys, test excavations, and block excavations completed at Locality 6 in 1995-1996.

Locating Fort Ellsworth

Prior to the 1996 excavations, the precise location of Fort Ellsworth remained a mystery. Surviving historical documents are vague, indicating only that the fort was built at the abandoned Page and Lehman Ranch at the Smoky Hill Crossing of the military road (Baer, Chapter 2). Three surviving maps provide clues to the fort's location, but these also present conflicting information. Prepared two years before the construction of the fort, the 1862 General Land Office (GLO) map (Figure 2.5) clearly depicts the location of the "Joseph Lemon" ranch. Despite the misspelling of Lehman's name, there is no doubt that this was the Page and Lehman Ranch, at that time the only settlement in the vicinity of the Smoky Hill Crossing. The October 15, 1866 map (Figure 2.8) prepared by military engineers depicts the location of the fort but not the ranch. A third map (Figure 3.1) is actually a revised version of the 1862 GLO map with an added notation "Ft. Ellsworth name changed to Ft. Harker," with a flag symbol depicting the fort's location. Who added this notation and when it was added is not known, but the location of the fort is roughly the same as shown on the 1866 map (Figure 2.8).

These maps clearly present a problem: the revised 1862 map depicts the fort's location almost ½ mile west of the old ranch. In which location was the fort located? Could it have been in both locations? And how do physical features and archaeological remains correlate with these locations?

That the 1862 map is reasonably accurate can be seen if one compares it to a modern topographic map (Figure 3.1). Stream positions in the vicinity of the ranch site are approximately in the same locations on both maps. Moreover, physical evidence for the military road (14EW105) has been found precisely where it is depicted on the 1862 map. On the other hand, the 1866 map in Figure 2.8 presents problems. Understandably, the ranch is not shown and one may presume that its structures were in some way incorporated into the fort. Fort Ellsworth is correctly depicted near the Smoky Hill Crossing as well as the junction of the two roads. However, when compared to the modern topographic map and the 1862 version, it is clear that the Smoky Hill River, Spring Creek, and the junction of the roads have all been shifted westward almost ½ mile. For whatever reason, this map is clearly inaccurate.

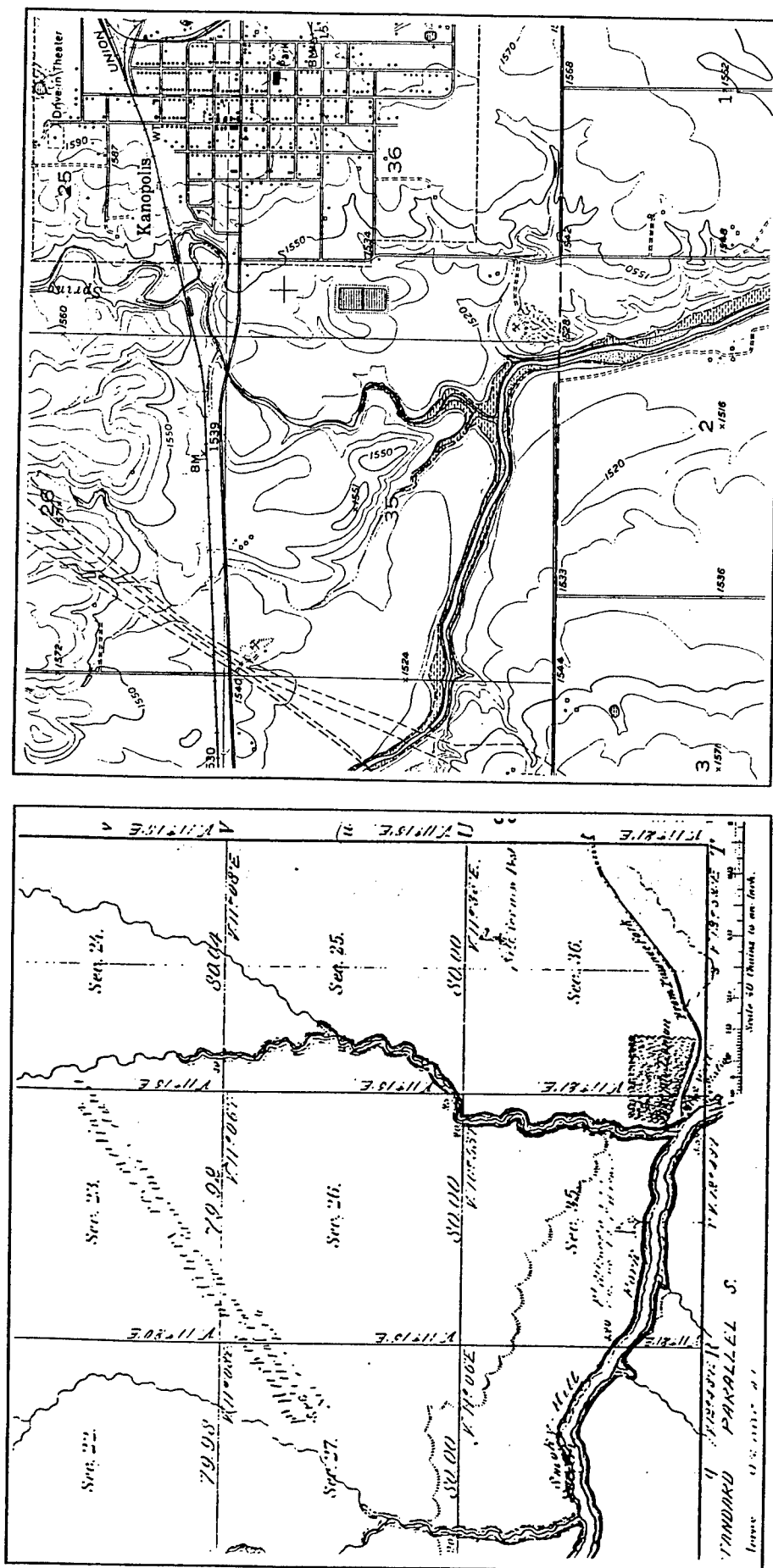


Figure 3.1. Comparison of annotated 1862 GLO map (left) and modern U.S.G.S topographic map (right). Barely readable on the GLO map (just below "Sec. 35") are a flag symbol and a notation, "Ft. Ellsworth named changed to Ft. Harker."

No archaeological evidence of Fort Ellsworth has ever been reported at the location shown on the maps. To be fair, this locality is private land and thus has received limited attention from professional archaeologists. Indeed, it was not the focus of this study, although the writer and Jim Gray obtained permission from the landowner, Mr. Lloyd Grothusen, and subsequently conducted a pedestrian reconnaissance of the area in April 1996. No physical remains or artifacts, except for a few specimens of 20th century glass and wire nails, were observed during the reconnaissance.

In 1996, we excavated two dugouts at Locality 6, which is just south of the purported site of the ranch and near the physical remains of the two old military roads. One of these dugouts contained a bakeoven, constructed by excavating into the high bank above the Smoky Hill River. It is significant that Alfred Gibbs, Commander of Fort Harker, complained in February 1867 that Fort Harker's bakeoven was 1¼ miles away and could not be removed because it was "dug in a bank" (NA 1865-1869:A. Gibbs to M. Morgan, 7 February 1867). Indeed, I am certain that in 1996 we excavated the bakeoven mentioned by Gibbs. In other words, we finally located remains of the elusive Fort Ellsworth.

Archaeological evidence of the Page and Lehman ranch has yet to be found. The location indicated on the 1862 GLO map (Figure 2.5) corresponds roughly to Locality 5, recorded by Lees and Schockley (1986). Archaeological investigations at Locality 5 in 1999 and 2000 failed to locate any physical remains of the ranch, but did unearth the remains of two dugouts and considerable quantities of associated military artifacts, clearly indicating that Fort Ellsworth extending into this locality. (The 1999 and 2000 investigations will be detailed in a subsequent report).

Description of Locality 6

Locality 6 contains a series of 14 shallow depressions along the terrace scarp some 20 ft. above the Smoky Hill River (Figure 3.2). Our excavations have proven that two of these are indeed dugouts, and the other 12 are thought to be cultural features as well. For analytical and descriptive purposes, this part of Locality 6 within and immediately adjacent to these 14 depressions is termed the "Dugouts." Above the Dugouts is the "Knoll," the highest elevation at Locality 6. A shallow, somewhat rectangular large depression extends from the top of the Knoll southward. The intervening, gradually sloping terrain surrounding the Knoll and extending to the Dugouts is termed the "Flats."

A segment of the military road (Fort Larned/Fort Zarah Road, 14EW105) passes through Locality 6 (Figures 3.2-3.4). This road has been obliterated by the modern sand pit just to the north of Locality 6, but just south of the fence separating private from Government land, a swale can be discerning as the road descends from higher ground toward the river. On lower ground, it consists of a wide roadbed, with ditches on both sides, leading to the earthen eastern approach ramp of the old government bridge. An earthen approach ramp still exists on the opposite riverbank as well, and during low water episodes, two sets of two wooden pilings from the old bridge can be observed in the bed of the Smoky Hill River (Lees and Schockley 1986:146-149).

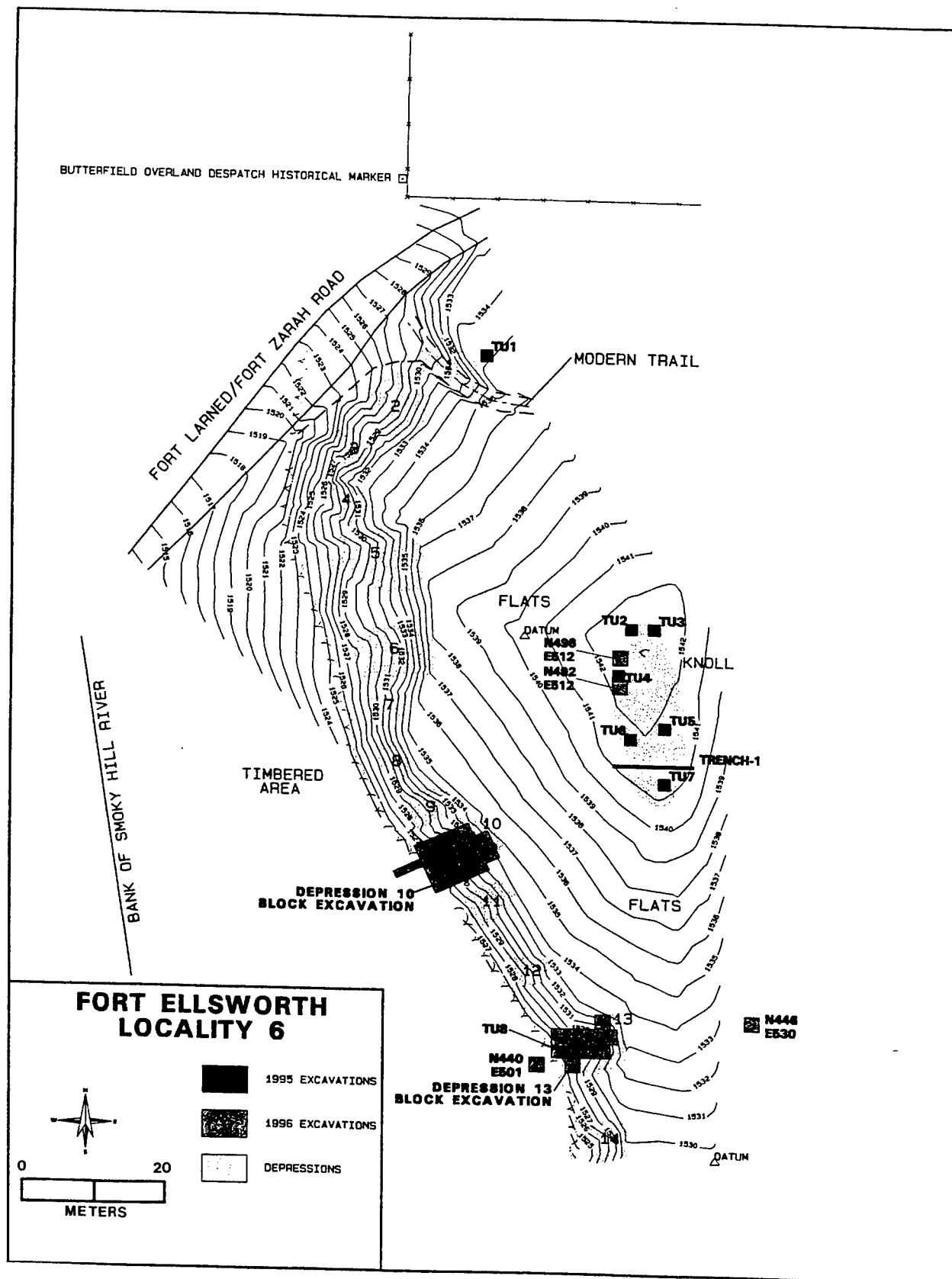




Figure 3.3. Aerial view of Locality 6. The military road (14EW105) extends from the corner of the sandpit (upper left) to the treeline. The dugouts are near treeline (center and right).



Figure 3.4. Another aerial view of Locality 6 showing the Smoky Hill River (top left).

Other notable features include a modern trail and a historical marker (Figure 3.2). The former is simply a modern dirt access road that has been worn into the terrace at the north end of the Locality 6; in fact it appears to have destroyed a good portion of Depression 1, thought to be the remains of a dugout. The other feature, a stone marker incised "B O D 1865" set in a concrete base was placed there in the 1960s by historian Howard Raynesford to commemorate the Smoky Hill Trail and the Butterfield Overland Despatch route (Lee and Raynesford 1980:227-229). The inscription impressed into the concrete base of the marker at 14EW26 reads:

SMOKY HILL TRAIL, BUTTERFIELD OVERLAND DESPATCH,
ATCHISON TO DENVER, TRAVERSED BY GEN. FREMONT 1844, FIRST
DENVER STAGECOACH 1859, MOST DANGEROUS OVERLAND ROUTE,
RETRACED AND MAPPED BY HOWARD G RAYNESFORD, ELLIS,
KANSAS, MARKER PLACED 1963..

Locality 6 came under Government ownership in the 1940s, and since acquisition it has not been cultivated but has been used for haying operations. A review of aerial photographs dating between 1938 and 1994 verifies this. As illustrated by the photographs as well as research conducted by Lees and Schockley (1986), no buildings or other structures that postdate Fort Ellsworth are known to have existed at Locality 6.

Metal Detector Surveys

In 1995, a preliminary metal-detector survey was conducted over the highest portion of the Knoll at Locality 6. Although limited in extent, this survey identified the presence of near-surface 19th century artifacts. A total of 25 artifacts was recovered from depths ranging just below the surface to a depth of no more than 20 cm below the surface. The following year, coverage was expanded to include the entire Knoll, the Flats, and the Dugouts. A total of 696 items was recovered, again from depths ranging just below the surface to approximately 20 cm below the surface.

Figure 3.5 shows the areal extent of the survey and all plotted and recovered artifacts. Metal detector operators began at the fenceline at the north end of the locality and worked southeastward, ultimately ending at a timbered ravine at the south end. To the west, the survey extended to the timber and heavy underbrush just beyond the line of dugouts. Survey to the east was halted due to time constraints. In addition to physical barriers and time constraints, one should also keep in mind that most, but not all artifacts, are probably associated with the Fort Ellsworth occupation. Agricultural, trapping, hunting, and sporting activities of later times also have contributed to the picture.

One clear result shown in Figure 3.5 is the unexpected concentration of artifacts on the Flats at the south end of the locality. Ground cover there was approximately the same as the cover on the Knoll, so the concentration is real and not induced by differing survey conditions.



Figure 3.5. Plot of all metal detector finds at Locality 6.

One test square (N446 E530) was excavated within this surface concentration in 1996 and conclusions based on this test are offered in a subsequent section of this chapter.

The relatively small number of artifacts in and around the Dugouts is probably related to survey conditions. This area consists of an undulating surface which could not be mowed without causing damage to the Dugouts, thus survey conditions were less than ideal. It should be noted that more artifacts were located in front of the two dugouts excavated in 1996 than at any other dugouts. The reason is simple. Survey conditions were better at the former because the metal-detector survey was conducted after excavations had begun and the grass had been either removed or trampled down by excavators.

The distributions of all artifact classes were examined but these produced few meaningful clusters or patterns. Hardware fasteners (mostly cut nails), and containers (mostly tin can fragments and lids), dominate the assemblage, numbering 252 and 127 respectively. A distribution of these (Figure 3.6) is much like the distribution of all artifacts shown in Figure 3.5. A large number of nails cluster at the south end of the locality. This may indicate that structures existed in the vicinity, or alternatively that trash disposal activity occurred there. Tin can fragments also cluster there and at the north end of the locality near Depressions 1 and 2. Can fragments may indicate trash disposal areas adjacent to living quarters.

Archaeological Testing of the Knoll

Archaeological test excavations began on the Knoll in 1995 (Figures 3.7-3.8). Initially this was termed the blockhouse area because it was hypothesized that high ground, overlooking the Dugouts and the military road, would be a likely location for a defensive structure. Additionally, it was thought that the shallow rectangular depression (measuring approximately 10 x 25 m) was of sufficient size to have resulted from the construction of a relatively large building; we do not know exactly how large the blockhouse was, but documents suggest that it might have been two stories. A sod commissary structure, described in historical documents as measuring 20 x 40 ft. certainly was another possibility.

The late amateur historian George Jelinek claimed in a 1957 newspaper article that some remains of Fort Ellsworth could still be seen:

Today, a visitor can still find remnants of the blockhouse, stones lying about, and if lucky, can find bullets, horse shoes, buttons, and such on the site. The embankment of the military bridge across the Smoky is still visible (Jelinek 1957).

The location of the blockhouse is never revealed in the article. It is interesting that Jelinek mentions the blockhouse and the military bridge embankment in the same paragraph, suggesting the possibility that the two were in close proximity. If so, he may have been describing the remains of a structure near the military bridge embankment at today's Locality 6.

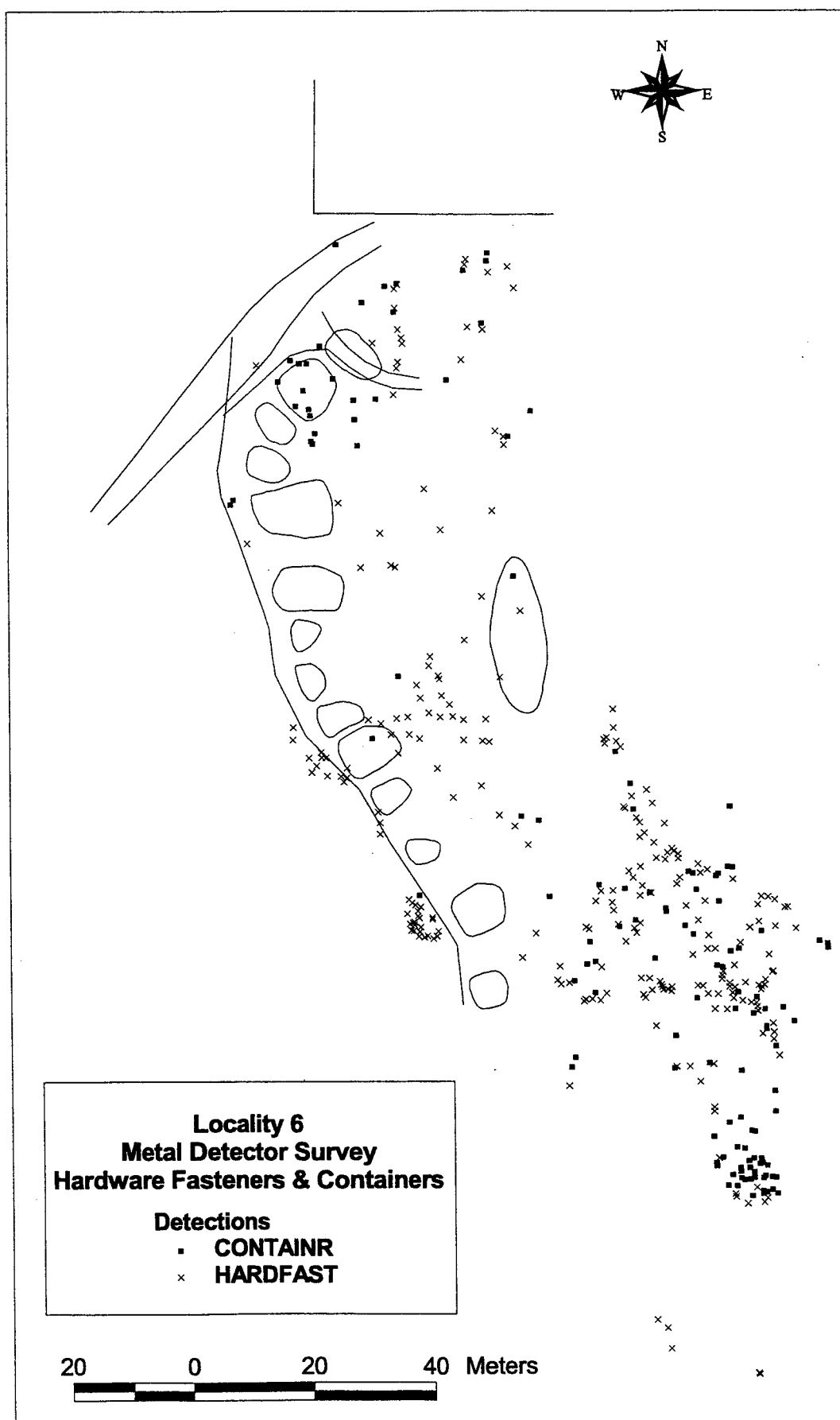


Figure 3.6. Plot of hardware fasteners and containers recovered during metal detector survey at Locality 6.



Figure 3.7. Testing on the Knoll in 1995. View looking southeast.



Figure 3.8. View looking north across the Knoll. Excavators in the foreground are recording data in Trench 1. Note the uneven character of the ground.

After the grass was mowed in 1995, the shallow depression on the Knoll at Locality 6 proved not to be one homogenous feature. The northern 2/3 was relatively uniform and had no other distinguishing characteristics. On the other hand, the southern 1/3 exhibited an uneven surface, possibly a number of discrete excavations from relatively recent digging. Artifact collectors or unauthorized researchers were possible candidates. Jelinek, for one, excavated at an unspecified location at Fort Ellsworth. In a small book entitled, *Frontier Land: Narratives of the Old West*, Jelinek (1973:n.p.) describes one such excavation:

I've also spent some time on the spot and found remains of the building, lots of bullets, broken whiskey bottles, mule shoes, buttons...the structure was made of sod and rock because I dug in the rubble for relics myself...

Jelinek (1973) asserts that he had located the 25 x 40 ft. commissary building. It is curious, however, that the 1957 and 1973 accounts of the remains are strikingly similar, including the statement that the structures were, at least in part, built of stone. It is likely that Jelinek was describing the same remains in both accounts, and that these remains were those on the Knoll at Locality 6. Indeed we encountered a considerable quantity of limestone in our excavations on the Knoll. Unfortunately, we will never know for certain whether Jelinek excavated at Locality 6, because he left no records behind.

The 1995-1996 metal-detector surveys and the 1996 geophysical investigation produced mixed results on the Knoll. As described above, artifacts consistent with the Fort Ellsworth occupation were found there during the metal-detector surveys. On the other hand, the geophysical investigation was less successful. Extremely high resistance values were probably produced by the plastic-lined and backfilled test units excavated there in 1995, while the metal datum at 500N 500E as well as the 1995 test units likely affected the values obtained during the magnetic survey (DeVore, Appendix A).

Test Units

To investigate the Knoll, six test units (TU2 through TU7) and an exploratory trench (Trench 1) were excavated there in 1995 (Figure 3.2). Two additional units (N496 E512 and N492 E512) were placed there in 1996 to investigate for additional evidence of a linear feature detected in TU4 the previous year. Initially, plans called for a block excavation on the Knoll in 1996, however a decision was made during the field season to abandon such plans in order to concentrate resources on the block excavations at Depressions 10 and 13.

Data regarding the size and depth of excavations on the Knoll are summarized in Table 3.1. (In subsequent discussions, I have converted the 1995 English measurements to metric equivalents for ease of comparison to the 1996 metric measurements). In 1995 it immediately became apparent that prehistoric inhabitants of the Smoky Hill phase (1000-1300 A.D.) of the Central Plains tradition occupied the Knoll before the soldiers (See Fox, Appendix B for a

Table 3.1. Excavations on the Knoll

Unit	Year	Size	Maximum Depth	Description
TU2	1995	5 x 5 ft.	3.0 ft. (91 cm)	SW 1/4 to 3.0 ft.; others to .5 ft.
TU3	1995	5 x 5 ft.	3.0 ft. (91 cm)	SE 1/4 to 3.0 ft.; others to .5 ft.
TU4	1995	5 x 5 ft.	1.5 ft. (46 cm)	N 1/2 to 1.5 ft.; S 1/2 to 1.0 ft.
TU5	1995	5 x 5 ft.	1.0 ft. (30 cm)	S 1/2 to 1.0 ft.; N 1/2 to .5 ft.
TU6	1995	5 x 5 ft.	1.0 ft. (30 cm)	NE 1/4 and SW 1/4 to 1.0 ft; others not excavated
TU7	1995	5 x 5 ft.	1.5 ft. (46 cm)	N 1/2 to 1.5 ft.; S 1/2 not excavated
Trench 1	1995	30 ft. x 18 in.	2.0 ft. (61 cm)	Entire trench excavated to 2.0 ft.
N492 E512	1996	2 x 2 m	50 cm	Entire square excavated to 50 cm
N496 E512	1996	2 x 2 m	40 cm	Entire square excavated to 40 cm

detailed discussion of all recovered prehistoric artifacts). Our focus, however, was the historic occupation so the majority of test units in 1995 and 1996 were excavated to the bottom of the historic component, between 30-40 cm below the surface. Two units, TU2 and TU3 were excavated deeper (91cm) to investigate the depth of the prehistoric deposits. Additionally, a long test trench (Trench 1) was excavated to 61 cm to determine the amount of disturbance in that apparently disturbed portion of the Knoll.

Stratigraphy

Profiles varied only slightly in the test units (TU2 through TU6, N496 E512, and N492 E512) placed in the northern 2/3 of the Knoll. Generally, they consisted of a very dark greyish brown (10YR 3/2) sandy loam extending from the surface to about 30 cm, underlain by a dark brown (10YR 3/3) sandy loam extending to about 58 cm, underlain by a brown (10YR 5/3) loamy sand extending at least to 91 cm below the surface, the bottom of the two deepest test units. In this part of the Knoll there were no obvious soil disturbances, except for rodent runs, on the surface or below the surface.

The southern end of the Knoll featured an undulating surface, apparently the result of a number of irregular-shaped excavations, some appearing to be 1-2 m in diameter (Figure 3.8). Trench 1 was placed in this area to ascertain the nature and depth of the probable disturbances. Highly mixed, disturbed soils containing a variety of cultural debris were encountered across the entire length of the trench to its bottom, or 61 cm. These mixed soils contained considerable quantities of limestone rocks and pebbles, as well as are uncharred and charred wood fragments, mortar, and lime. Although these items are suggestive of the remains of a building, no intact foundation remains were found. Mixed in with these probable building remains were prehistoric and historic artifacts. TU 7, placed at the southern end of the Knoll, also exhibited mixed, disturbed soils extending to the bottom of the test unit, at 46 cm below the surface. These soils contained a considerable quantity of pebbles, 40g of uncharred wood, prehistoric artifacts, and

historic artifacts. Other notable artifacts recovered from TU7 are seven prehistoric pottery sherds, all from the 0-15 cm excavation level.

Features

Feature 1 was a concentration of animal bone, measuring 81 x 30 cm, and discovered only 9-18 cm below the surface in TU4 (Figure 3.9). Mixed soils indicated that the bones were in secondary context. There were six bones, one unidentified bone and five bones (scapula, radius, ulna, humerus, and 3rd phalange) of *Bos Taurus* (cattle). The radius exhibits ax/cleaver marks while the ulna is sawn on one end (Bozell, Chapter 5). No artifacts were found in direct association with the feature, however a line-eagle general service button and two .52 cal. Spencer cartridge cases were found elsewhere in TU4, in the same vertical level as Feature 1. The shallow depth of Feature 1, the historic artifacts found at the same vertical level, and the evidence of butchering with a saw, all suggest that the feature is associated with the military occupation of the Knoll.

Feature 2, also in TU4, included the remains of a wooden board set upright in the ground (Figures 3.9-3.10). The board was first encountered at 18 cm below the surface and was found to extend to 60 cm below the surface. The board appeared to have been set in a trench measuring approximately 27 cm wide that may also possibly have extended lengthwise to the north and south walls of TU4. The fill of the trench was a mottled very dark grayish brown 10YR 3/2 and dark yellowish brown 4/4 sandy loam, mixed with a large number of limestone pebbles and two larger limestone rocks. Only one artifact, a small triangular projectile point, was recovered from the trench fill; it was found while screening the fill. Although this trench appeared to extend beyond TU4, excavation of the adjoining unit to the south (N492 E512) and the unit approximately 1.4 m to the north (N496 E512) in 1996 failed to detect any further evidence of the trench.

The board was broken on the top and in poor condition overall. Remnants of straight sawn edges suggest it was about 14 1/4 in. wide and about 7/8 to 1 in. thick. The bottom of the board also exhibited a straight sawn edge; a whitish very soft lime-like deposit adhered to the bottom of the board and extended upward for as much as 20 cm. The board cracked lengthwise when removed in 1995, suggesting a seam where two boards had been joined together during manufacture. Adair (Chapter 6) identified a sample of wood from Feature 2 as juniper.

The sawn board clearly associates Feature 2 with the historic occupation of the Knoll. One interpretation of this feature is that it represents a small portion of a wall of a temporary building. Setting sawn boards in a trench is not a common building technique, but I am aware of an example discovered on an 18th century military site. At Fort Edward, a French and Indian War site in New York state, researchers discovered several fragments of boards set vertically in a clay-filled trench. The clay-filled trench formed three sides of a large square, interpreted as the wall remains of a "wooden tent" shelter, a light temporary structure having board walls covered by a tent (Howe 1995:42-45). This interpretation of Feature 2 is discounted because: (1) No evidence of a trench was found in the adjacent test unit to the south or the nearby test unit to the

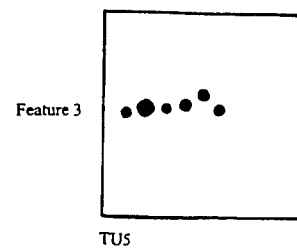
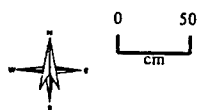
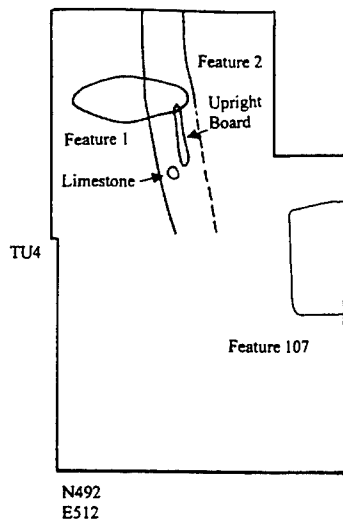


Figure 3.9. Plan of all recorded features on the Knoll.

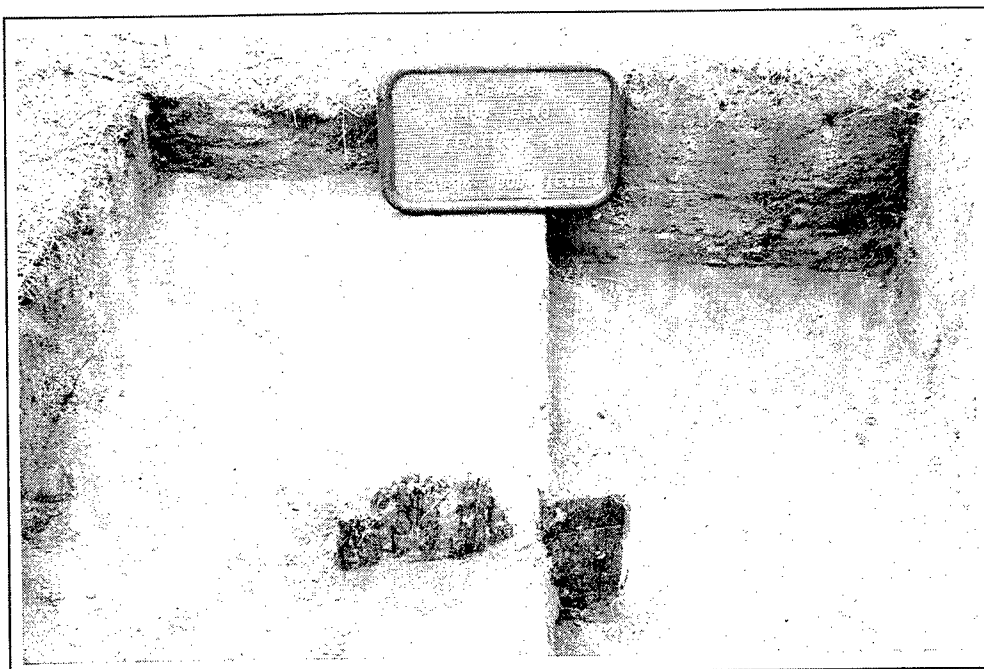


Figure 3.10. Feature 2.

north; and (2) There is no archaeological or documentary evidence indicating that boards were used in wall construction; walls in Dugouts 10 and 13 excavated in 1996 exhibited only log construction.

Feature 2 may be the remains of a wooden headboard, set in the ground to mark a grave. In the 19th century, boards of various sizes, or simple wooden crosses, were commonly used as grave markers (Owsley et al., n.d.:50; Rosa 1982:194). Indeed, four specimens of human bone were recovered from shallow levels at TU4, though not within Feature 2. No physical evidence of a graveshaft was identified in TU4, but given the north-south orientation of the wood in Feature 2, it is possible that one is present in the adjacent unexcavated areas to the east or the west of the test unit. (Further discussion of the human remains, and the likelihood that soldiers were interred on the Knoll in graves marked by wooden headboards, is presented below in this chapter).

Feature 3 consisted of a linear arrangement of six small stains in TU5 (Figure 3.9). All are dark stains with no apparent inclusions. They vary in size from 7-12 cm in diameter and were first detected in the light-colored subsoil at 28 cm below the surface. Time did not permit further excavation and cross-sectioning so the depth of these stains is not known. No artifacts were directly associated with Feature 3, although prehistoric debitage as well as historic artifacts were recovered from other proveniences at TU5. The regular spacing and vertical orientation of the stains suggest that they are postmolds of some portion of a light structure. Documents as well as archaeological evidence from Dugouts 10 and 13 indicate that some fort buildings were constructed by setting upright posts in the ground. Posts in the two dugouts, however, tend to be larger than those in Feature 3, and set in trenches. Without further evidence I cannot say whether

Feature 3 is associated with Fort Ellsworth, or alternatively, with the prehistoric occupation of the Knoll.

Feature 107, a tan-colored rectilinear stain, was only partially exposed since it extended into the east wall of unit N492 E512 (Figure 3.11). Due to mixed soils from probable 20th century disturbances, Feature 107 was not detected until excavators had reached 40 cm below the surface. At 50 cm below the surface, the feature measures (north-south) a maximum of 72 cm (Figure 3.11). The feature extends to a maximum depth of 71 cm below the surface (Figure 3.11). The matrix of Feature 107 consisted of a tan-colored sandy loam that contrasts with the surrounding dark brown sandy loam. This tan-colored matrix is fairly uniform throughout, except for a few rodent burrows. No artifacts were found within the excavated portion of the feature, and a flotation sample produced only modern seeds (Adair, Chapter 6). The lack of strata and the absence of cultural remains suggest that Feature 107 was backfilled with sterile soil in one episode.

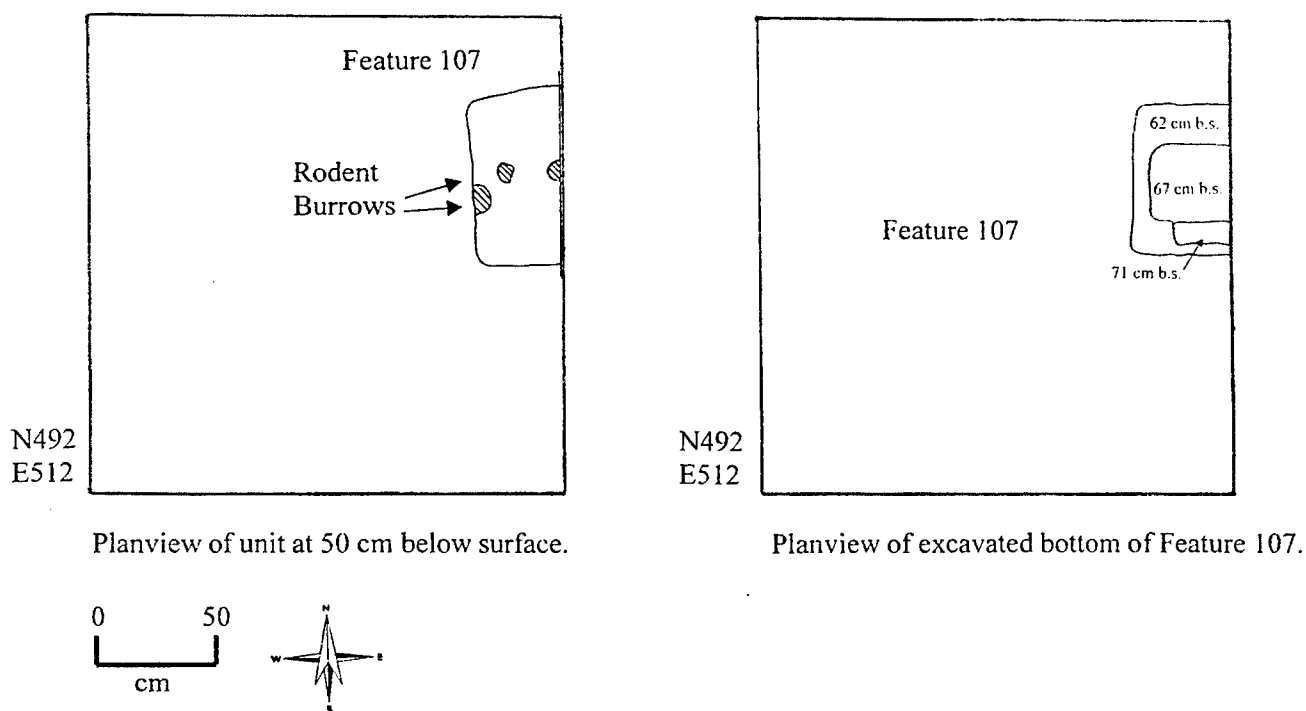


Figure 3.11. Planviews of Feature 107 .

The identification of this feature is problematic. The squareness of its corners does not conform to known features of the Smoky Hill Phase. More likely, it dates to the historic occupation. One possibility is that it was a post hole for a large square post, such as the one found in Dugout 13 (see below). This would account for the squareness, but not why the hole was backfilled with the tan-colored sandy loam after the post was removed. However, only a portion of the feature has been exposed, and until it is exposed in its entirety, any pronouncements regarding its function are only speculative.

Distributions of Artifacts and Food Remains

Prehistoric artifacts were recovered from all test units on the Knoll while historic artifacts were recovered from all test units except TU3. During the metal-detector survey, metal items were recovered immediately adjacent to TU3 so it is safe to say that both historic and prehistoric materials were recovered from all portions of the Knoll.

Vertically, the historic artifacts tend to occur near the surface and at shallow depths, usually 20 cm or less from the surface. Table 3.2 represents counts of artifacts that safely can be attributed to either the prehistoric or historic occupations. Sixty-seven percent of the historic artifacts were recovered within 20 cm below the surface, with the remaining 33% between 20-40 cm, and none exceeded 40 cm. These findings are consistent with the shallow depths of the two identified historic features, 1 and 2. Prehistoric artifacts were recovered from the upper 20 cm as well (44% from 0-20 cm), and greater depths (38% from 20-40 cm, and 19% below 40 cm). In the two deepest test units, TU2 and TU3, prehistoric artifacts were thinly and evenly distributed through all excavation levels from the surface to a maximum of 76 cm below the surface.

Table 3.2. Prehistoric and Historic Artifact Depths on the Knoll

	Prehistoric			Historic		
	0-20	20-40	40-	0-20	20-40	40-
TU2	7	0	11	2	0	0
TU3	8	1	4	0	0	0
N496 E512	11	20	0	4	4	0
TU4	4	8	3	12	4	0
N492 E512	5	9	1	0	2	0
TU5	5	0	0	3	1	0
TU6	4	0	0	1	0	0
Total	44	38	19	22	11	0

Note: Disturbed units (Trench 1 and TU7) not included.

Only one artifact, the line-eagle general service button, provides direct evidence of the military occupation of the Knoll. Fox (Chapter 4) dates the use of this button style by the military between 1851-1884. The only other temporal indicators from the Knoll, the .52 cal. Spencer cartridge cases, probably date to the 1860s (Fox, Chapter 4). All of the other excavated historic artifacts cannot be tightly dated, but are consistent with a 19th century occupation.

Most noteworthy is the presence on the Knoll of a variety of artifact types suggestive of a building (Table 3.3). Construction materials (mortar, lime, mortar and sand conglomerated) were

Table 3.3

Material Remains from the Knoll: Test Units Listed from North to South

Category	TU2	TU3	N496 E512	TU4	N492 E512	TU5	TU6	Tr. 1	TU7
Construction (g.)			.7	93.0		33.0		25.2	
Hardware	2		3	12	1	3	1	4	1
Military Equipment				1					
Ammunition				2				1	2
Apparel					1				
Personal			2			1			
Containers: Tin Cans			2						
Containers: Glass				1				1	
Other Organic (g.)	3.5	4.1		5.8				8.4	40.0
Prehistoric	18	13	31	15	15	5	4	27	8
Bone (g.)	42.7	14.3	38.9	266.2	19.1	12.5	0	7.7	13.7
Shell (g.)	8.4	8.4	18.9	7.9	20.2	5.7	0	13.9	3.4

recovered from N496 E512, TU4, TU5, and Trench 1. Uncharred wood was recovered from TU4, Trench 1, and TU7. Considerable quantities of pebble-size limestone, which could have been used as material for building footings, were recorded as present in N496 E512, TU4, N492 E512, Trench 1, and TU7. Finally, small quantities of cut nails were recovered from all test units on the Knoll except TU3. If the construction materials at the south end of the Knoll are an accurate indicator, there may have been another structure there as well. Given the amount of disturbance, however, it seems unlikely that much evidence of the structure remains intact.

Bone and shell remains were recovered from all test units except TU6 (Table 3.3). (A small amount of human remains included in Table 3.3 is discussed separately in the next section). Other identifiable bone elements include deer, cattle, pronghorn, and striped skunk (Bozell, Chapter 5). Cattle remains from Feature 1, as well as sawn cattle vertebrae from a depth of approximately 21 cm below the surface in TU5, are clearly associated with the historic occupation of the Knoll. Mussel shell, recovered from all test units except TU6, was more likely deposited there by the prehistoric occupants. As Bozell (Chapter 5) points out, the procurement of mussels is well documented for the Central Plains prehistoric tradition but not for the military.

Human Remains

During his study of bone and shell remains, Bozell (Chapter 5) identified 24 specimens, all from the Knoll, potentially of human origin. All 24 were delivered to physical anthropologist Dr. Michael Finnegan of Kansas State University for positive identification. He identified 21 of

these as complete or fragmentary specimens of human origin including teeth and bones/bone fragments representing fingers, toes, vertebrae, and a small rib (Finnegan, Appendix C). He indicates a minimum of one individual of unknown ancestry. The recovered incisor is not shovel-shaped but he does not eliminate the possibility of Mongoloid (Native American) ancestry; instead he recommends that ancestry be based on the context from which the bones were recovered.

All of the human remains were recovered from three test units (TU4, TU5, and TU7) at shallow depths (Table 3.4). These remains were not directly associated with recorded features or with artifacts of either period. Indeed, artifacts of the historic and prehistoric periods were intermixed with the remains. Despite any definite associations, two facts stand out. First, the remains were shallowly buried, suggesting they are associated with the historic occupation. It is notable that historic artifacts on the Knoll generally occur within 20 cm of the surface. Prehistoric artifacts occur there too but also extend to 76 cm below the surface. Second, the remains consist of small-sized skeletal elements, few in number. The significance of this second fact is discussed below.

Table 3.4
Provenience of Human Remains from Locality 6

Test Unit	Quantity	Below Surface
4	1	(0-15 cm)
4	2	(12-26 cm)
4	3	(21-30 cm)
4	1	(0-15 cm)
5	1	(12-21 cm)
5	1	(0-21 cm)
5	1	(21-37 cm)
7	9	(0-12 cm)
7	2	(12-27 cm)
Total	21	

Could they be soldier remains? This possibility was first suggested when a local resident, Mr. Lyle Harrel, reported the local tradition that the Knoll was the location where soldiers were buried. A military document led to further research in this regard. According to a letter dated May 10, 1880 found by Cynthia Baer, a Mr. Marks offered to remove to Fort Leavenworth the "remains of twelve to fifteen deceased soldiers" all buried on "one spot of ground about ¼ acre" at Fort Ellsworth (NA 1795-1915:I. Marks to Depot Quartermaster at Fort Leavenworth, 10 May 1880). Documents verifying whether they were actually removed could not be found in the National Archives or the other archives consulted. However, the records of interments and

reinterments at the Fort Leavenworth National Cemetery clearly document that 16 unknown soldiers were removed from "Old Fort Ellsworth" and reinterred in the National Cemetery in July 1880 (Fort Leavenworth National Cemetery n.d.:230-231). Today, sixteen tombstones, each bearing an engraved shield with the engraved words, "UNKNOWN U.S. SOLDIER" can be found in Section C (Nos. 1737-1752) of Fort Leavenworth National Cemetery (Figure 3.12).



Figure 3.12. Graves in Section C (Nos. 1737-1752) at Fort Leavenworth National Cemetery containing the remains of soldiers from Fort Ellsworth.

The preponderance of evidence points to the remains on the Knoll being those of soldiers. First, the remains lack any definitive Native American traits. Second, there is documentary evidence of soldier graves at Fort Ellsworth. Third, the remains are small-sized, few in number, and widely scattered. Bones of this size could have been missed, that is simply left behind, when the remains were removed to Fort Leavenworth in 1880. Such was the case at the Little Bighorn Battlefield when human remains from individual graves were reinterred to a mass grave in 1881 (Scott and Fox 1987:17). The lack of any clearly identifiable graves on the Knoll is problematic, although much of this evidence could have been obliterated by workers during the 1880 removal efforts or by 20th century intruders, perhaps Jelinek. Finally, it was proposed above that the vertical board in Feature 2 might be the remains of a wooden headboard grave marker. In his 1880 letter, Mr. Marks implied that the graves might be marked by headboards: "If it is the desire of the Government to remove them to the National Cemeteries, I would respectfully inform the Quartermaster that I would undertake their removal, furnishing boxes, etc; also making a record of the names, companies, and regiments as far as the headboards will admit" (NA 1795-1915:I. Marks to Depot Quartermaster at Fort Leavenworth, 10 May 1880).

One might question why a cemetery was established so close to the Dugouts. One possible explanation is that the cemetery came into existence after the Dugouts and other structures were abandoned in the spring of 1867. From Alice Baldwin's account we know that the dugouts at the Fort Ellsworth site were occupied at least until April 1, 1867 when the Hancock expedition reached Fort Harker (Baldwin 1928:131-132; Kennedy 1997:51). The Fort's structures were ordered razed to the ground in June 1867 (Choitz 1967:7). Perhaps military officials seized the opportunity to use the Knoll as an interim cemetery until one could be completed at Fort Harker. Surgeons' reports show 62 deaths at Fort Harker in 1867; most died from the cholera epidemic that struck Fort Harker that summer (King 1997:322-324, Appendix 4). Sometime during 1867, a 290 ft. sq. cemetery with broad walks, planted trees, and a post-and-plank fence around its perimeter, was laid out about ¼ mile southeast of Fort Harker. By 1870 the cemetery contained 183 graves, mostly those of individuals who died from the 1867 epidemic (King 1997:78).

The current plan is to rebury all of the human remains in one small container in one of the unknown soldier graves at Fort Leavenworth. In preliminary discussions, officials at the National Cemetery indicate that this is both possible and appropriate. When completed, the cemetery will keep records of the reburial.

Summary of the Knoll Investigations

Investigations of the Knoll indicate a complex history there. Clearly, it was occupied first by Smoky Hill peoples sometime between A.D. 1000-1300 and later by Fort Ellsworth troops. Our investigations also produced human remains, and intrusions by 20th century artifact collectors. Our focus was the historic period utilization of the Knoll, and even for that period, limited test excavations were inadequate for determining the dimensions of structures or activity areas. Horizontal exposure of a large area of the Knoll would likely have been more productive.

We had planned a block excavation there, but the excellent preservation of the structural remains of the dugouts dictated that we spend precious time and resources excavating those structures. Moreover, given all of the activities that have occurred on the Knoll, and the 20th century intrusions, even further excavation may prove inadequate to determine the scope and sequence of events there.

Nevertheless, I will suggest a tentative sequence of events on the Knoll during the historic period. Sometime during the military occupation of the Fort Ellsworth site, at least one structure stood near the highest elevation of the Knoll, the location where we found quantities of building materials and stone. Additional building materials recovered from the south end of the Knoll suggest that another structure may have stood there as well. There is no archaeological evidence that these buildings were burned when the Fort Ellsworth site was abandoned in 1867; perhaps they were razed to the ground or moved to Fort Harker. Following the abandonment of the site, soldiers were interred on the Knoll. Their remains were later removed from the Knoll and reinterred at Fort Leavenworth in 1880, although small bone elements were left behind on the Knoll. In the 20th century, unauthorized persons excavated the south end of the Knoll.

Evidence of their work was observed in our tests units, and remnants of their large potholes can still be seen on the surface today.

Archaeological Testing on the Flats

Archaeological excavations on the Flats consisted only of two test units. In 1995, TU1 (Figure 3.2) was placed just north of a modern dirt trail that has been worn down through Depression 1, a possible dugout. Definite 19th century artifacts including black (olive-green) bottle "finishes," a hole-in-cap tin can lid, cut nails, and a tinned-iron four-hole button were found in the trail cut, eroding out of the highest elevations as the trail begins to descend the scarp to lower ground. We reasoned that these artifacts might be eroding from the higher ground to the back of the probable dugout. TU1 was set up as a five ft. sq. test unit, but due to generally poor results only the SW ¼ of the unit was actually excavated. No features were encountered and materials were recovered from only one level, .2-.7 ft. (6-21 cm.) below the surface; these are four cut nails and three small unidentifiable bones (Table 3.5). The ¼ unit was excavated to 1.5 ft. (46 cm) below the surface with soils at all levels consisting of a sandy loam. The dirt trail has been monitored several times since 1995 and no additional artifacts have been found.

The second excavation in the Flats was a two m sq. unit placed at N446 E530 (Figure 3.2) in 1996. This unit was deliberately placed within the large concentration of metal artifacts at the southern end of Locality 6 identified during the metal detector survey (Figure 3.13). Anomaly 2, identified during the magnetic survey, also suggested a collection of discarded metal here (DeVore, Appendix A). The test unit was designed to sample the composition and depth of these rather widespread deposits. After removal of the metal-detector located artifacts, the test unit was excavated in four, 10 cm levels. Due to the slope of the ground at N446 E530, however, only the extreme northwest corner of the 0-10 level was excavated. Soils consisted of a sandy loam throughout the four levels and no cultural features were encountered.

Both prehistoric and historic artifacts were recovered from this square (Table 3.5). Prehistoric finds consist of only two pieces of debitage, both recovered from the 10-20 cm level. The far more numerous historic artifacts were recovered from all four levels, but were clearly concentrated in the 10-20 cm and 20-30 cm levels, or for the most part, between the surface and 20 cm below the surface due to the sloping surface within the unit. Except for two wire brads, the historic artifacts recovered from N446 E530 are consistent with the Fort Ellsworth occupation. Most notable is a line-eagle general service button, recovered from the 10-20 cm level. Potential food resources are indicated by *Lepisosteus* sp. (gar) scales, *Amelanchier* sp. (June-berry) seeds, and *Zea mays* (corn) kernels.

Without further testing and surface survey it is not possible to say with certainty what the historic deposits at N446 E530 and the southern end of Locality 6 actually represent. The sloping topography of this portion of Locality 6 is not suitable for habitation. It could have been used for trash disposal, but a ravine at the extreme southern end of Locality 6 would have been better suited for that purpose. Due to time constraints, dense vegetation, and visible 20th century

debris, we did not investigate the ravine. Understanding the utilization of the southern end of Locality 6, including the ravine, will have to await additional research.

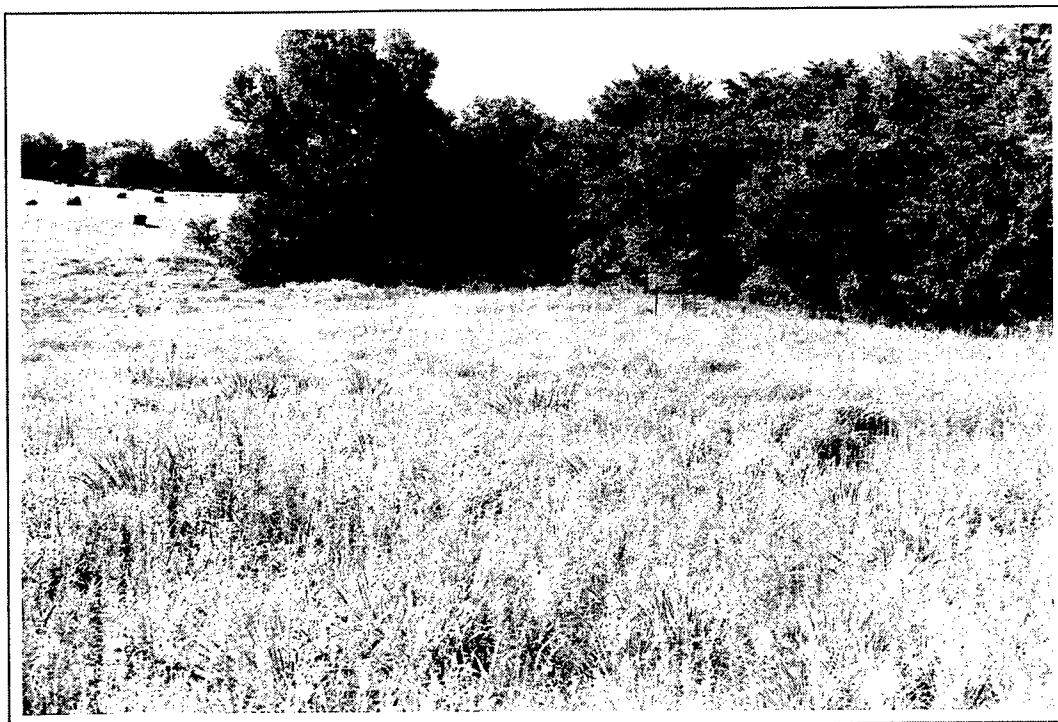


Figure 3.13. Flats area at south end of Locality 6.

Table 3.5
Material Remains from the Flats

Category	TU1	N446 E530
Hardware	4	16
Ammo		1
Military		1
Containers: Tin Cans		4
Containers: Glass		38
Other Glass		45
Prehistoric		2
Bone (g.)	3.0	18.2
Other Organic (g.)		4.0
Botanical		2

Archaeological Data Recovery at Depressions 10 and 13

In 1996, we excavated at Depression 10 and Depression 13, two of a total of 14 depressions suspected to be dugouts associated with Fort Ellsworth (Figure 3.2). Time and resources dictated that we could excavate only two, thus the selection was based upon physical appearance, metal-detector and geophysical surveys, and archaeological testing. Physically, each of the two depressions ultimately selected was large, well-defined, and opened toward the southwest, or downslope side of the terrace scarp. It was reasoned that the high definition of these two depressions was a likely indicator of a high degree of archaeological integrity of the suspected dugouts. Regarding possible associated artifacts, a 1995 preliminary metal-detector survey identified a number of "hits" within and adjacent to each; notation of these "hits" was made, but they were not excavated. Likewise, the 1996 magnetic survey identified possible iron artifacts (Anomaly 4) in and around Depression 10, as well as possible discarded metal artifacts (Anomaly 1) along the southern edge of Depression 13. On the south side of Depression 13, the 1996 resistance survey produced higher resistance values, interpreted as an indicator of a wall cut or wall materials (DeVore, Appendix A). Finally, TU8, placed in Depression 13 in 1995, produced a number of 19th century artifacts and a large quantity of animal bone, some with clear evidence of butchering.

Excavations at Depression 10

The depressions at Locality 6 are located along the highest terrace scarp of the Smoky Hill River. In the vicinity of Depression 10, the difference in elevation between the base and the highest point of the scarp is approximately 3.0 m (Figure 1.3). On the surface, the actual physical depression measured approximately 12.0 m northeast-southwest, and 7.0 m southeast-northwest (Figure 1.3). Depth varied across the depression but did not exceed 1 m. (Note: hereafter the term "Depression 10" will be used to refer to the physical surface depression resulting from the collapse of the dugout while "Dugout 10" refers to the physical remains of the dugout and associated deposits; feature numbers were assigned to Depression 10 (Feature 102) and Dugout 10 (Feature 109), however in subsequent discussions the former terms will be used).

The block excavation was aligned with the long axis of the depression (Figure 3.2). To expose the dugout and associated cultural deposits, thirteen 2 X 2 m squares and eight 1 x 2 m squares were excavated in a block (Figure 3.14). Excavation began with north-south and east-west trenches (1 x 2 m units) to determine the horizontal limits of Dugout 10 (Figure 3.15). Trench A consisted of seven units (x-1 through x-7) while Trench B consisted of two units (x-1 and x-2). Trench C was then added and the two 1 x 2 m units of Trench C were combined with those of Trench B to form the two, 2 x 2 m units, x-1 and x-2).

Units x-1 and x-2 of Trench A were abandoned after only one excavation level when it became apparent that both were beyond the limits of the dugout. Within the limits of the dugout portion of Dugout 10, excavation proceeded to the floor of the dugout and finally to sterile soil.

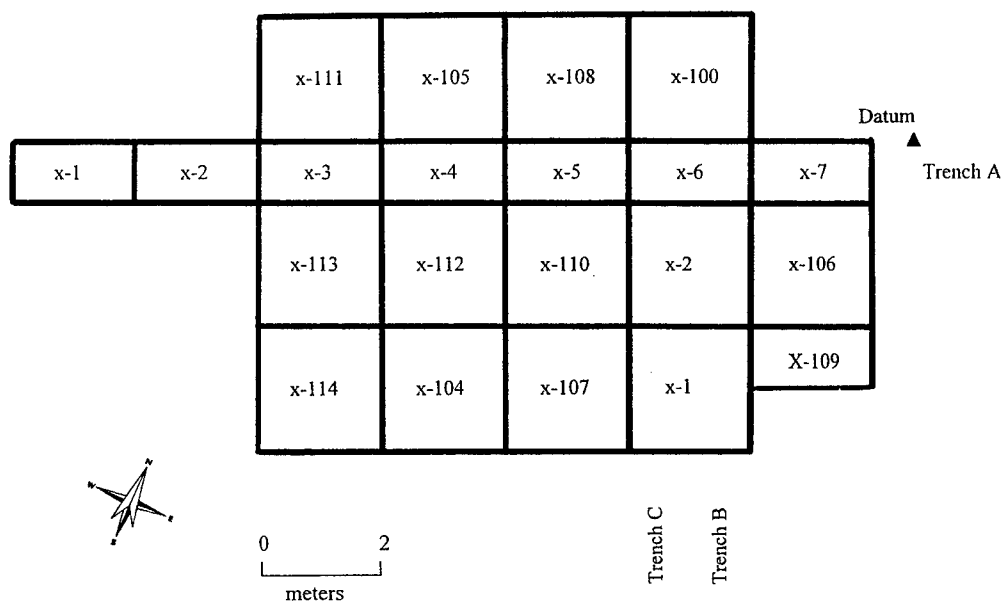


Figure 3.14. Block excavation at Depression 10.



Figure 3.15. Initial trenches at Depression 10.

Within the limits of the bakeoven feature, excavation was completed deeply enough to expose the intact bakeoven surface and other intact bakeoven features that lay beneath collapsed materials. To expose the intact bakeoven elements, much loose construction material (brick, mortar, and stone) had to be removed. Although all of the loose bakeoven construction materials were removed, only representative samples were retained for further study and analysis.

Dugout 10

Overview

Initially, definition of the precise limits of Dugout 10 was not possible because both the natural soils and cultural fills were dark colored. But at approximately 30 cm below the surface, the 1860s cut into the terrace scarp was clearly defined by a distinct interface between darker-colored cultural fills within the feature and lighter-colored sterile soils beyond. Cultural fill deposits within the feature consisted of dark brown or dark grayish brown sandy loams or sandy clay loams containing many artifacts. In contrast, soils beyond the feature generally consisted of culturally-sterile, yellow-brown clays, clay loams, or sandy loams.

The exposed dugout measured a maximum of approximately 8.87 m (29 ft. 1 in.) along the long axis and 4.74 m (15 ft. 7 in) along the short axis (Figure 3.16). Postmold lines defined the actual location of the north, south, and west walls of the structure (Figure 3.17). A constructed waist-high ledge of rough-dressed sandstone formed the division between the dugout floor and the front of the bakeoven (Figure 3.18). Surviving elements of the bakeoven include the ashbox, a portion of the baking surface, and the base of the brick arch. Detailed descriptions of the postmold lines, bakeoven, as well as other designated features are provided below. Table 3.6 summarizes all recorded features.

Structural Features

Wall Lines

Several features (139, 145, and 149) represent the archaeological evidence of walls of the dugout (Figure 3.16). The first evidence of postmolds and a footing trench was exposed in unit x-107 on the south edge of the block excavation and this feature was designated Feature 137. After further excavation, Feature 137 was found to extend westward into units x-104 and x-114 and this segment was subsequently assigned Feature number 145. Evidence for the north wall was designated Feature 139, while the west (front) wall was designated Feature 149.

On each of the three sides, dark-colored circular stains were identified within linear, irregular, slightly lighter-colored stains interpreted as footing trenches. (Three posts in the north wall appear to have been set directly into the ground). Overall, the footing trenches varied in width between 20-40 cm and extend to a maximum depth of 62 cm below the floor of the dugout.

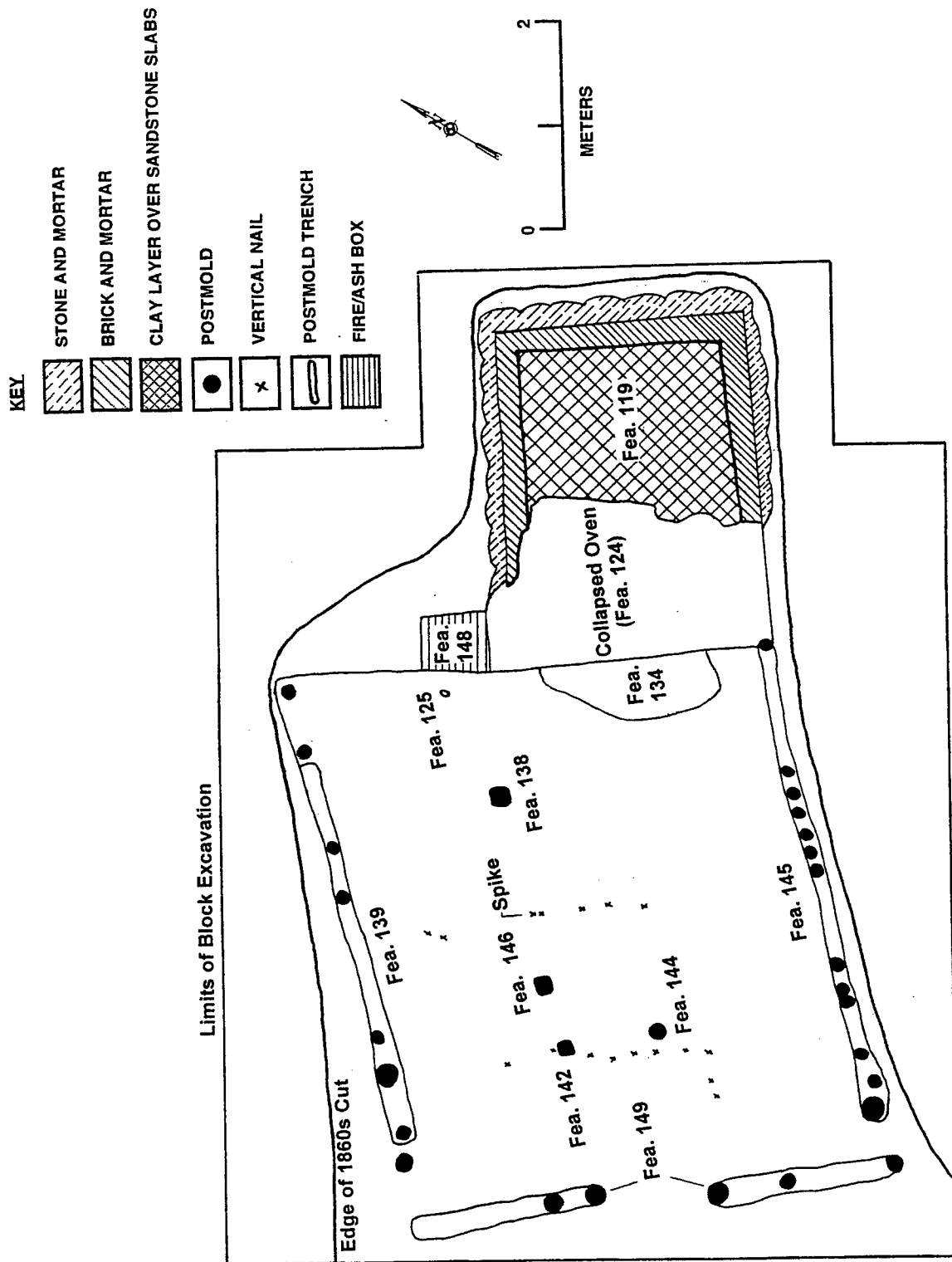


Figure 3.16. Plan of excavated floor and bakeoven of Dugout 10.



Figure 3.17. View of Dugout 10 (bakeoven in foreground, dugout floor in background).



Figure 3.18. View of Dugout 10 (dugout floor in foreground, bakeoven in background).

Table 3.6				
Summary of Features-Dugout 10				
Feature	Unit(s)	Depth	Brief Description	Comments
102			Depression 10 defined	Surface depression from Dugout collapse
109			Dugout defined	Dugout 10 remains
110	x-1, x-2		Brick and mortar rubble	Rubble from collapsed bakeoven
112	x-107	40*	Canvas fragment	In fill above floor of dugout
117	x-108	96*	Cast iron roast/bake pan	Found in collapsed north wall of dugout
118	x-108	112-118*	Possible postmold	Determined to be rodent disturbance
119	x-1, x-2, x-6, x-7, x-106, x-109	169	Bakeoven	Intact baking surface
124	x-5, x-110	222-255	Fall debris	From bakeoven collapse
125	x-5	243	Burnt wood	On floor of dugout near front of oven
134	x-107, x-110	255-275	Charcoal and ash concentration	In floor of dugout near front of oven
135	x-105	263	Knife handle	Near north wall of dugout
137	x-107	154-195	Postmold line	Posts set in trench-south wall of dugout
138	x-5	271-283	Postmold	Large square postmold in floor of dugout
139	x-105, x-108, x-111	280-287	Postmold line	North wall of dugout
142	x-112	272-298	Postmold	Large square postmold in floor of dugout
143	x-108	268-297	Postmold	Eastern terminus of Fea. 139
144	x-112	278-291	Postmold	Large square postmold in floor of dugout
145	x-104	266-328	Three postmolds	South wall of dugout
146	x-112	272-307	Postmold	Large square postmold in floor of dugout
148	x-5, x-6, x-100, x-108	184-244	Fire/Ash box for bakeoven	On left/front side next to bakeoven
149	x-3, x-111, x-113, x-114	342	Footing trench	West wall of dugout
*Below surface; all others measured below datum				

The break in the west footing trench and absence of postmolds in that break is suggestive of a doorway at the front of the dugout. Door hardware including rectangular door hinge fragments and a pintel, were recovered from the front of the dugout.

Postmolds on each of the three sides varied considerably in size, ranging from 13-44 cm in diameter (Figure 3.16). Cross-sectioning of the postmolds indicates that the posts were tapered at the end (e.g., Figure 3.19). They were set into the ground to depths ranging from 24-57 cm. Some of the posts may have rotted in place, suggested by badly decomposed wood fragments from two postmolds in the south wall line and one postmold in the north wall line. Burning is also indicated by small fragments of charcoal in three postmolds, all along the north wall line. An amber bottle fragment and four charred seeds of *Galium* (bedstraw) were recovered from three cross-sectioned postmolds (Feature 145) along the south wall line.

Mortar recovered from the two posts at the northeast corner of the dugout indicates that these posts had been mortared in place. This mortar appears to be similar, if not identical in composition, to the mortar used in the construction of the bakeoven. This evidence, although limited, suggests that the bakeoven and the dugout were built at the same time, rather than one structure being an addition to an existing one.

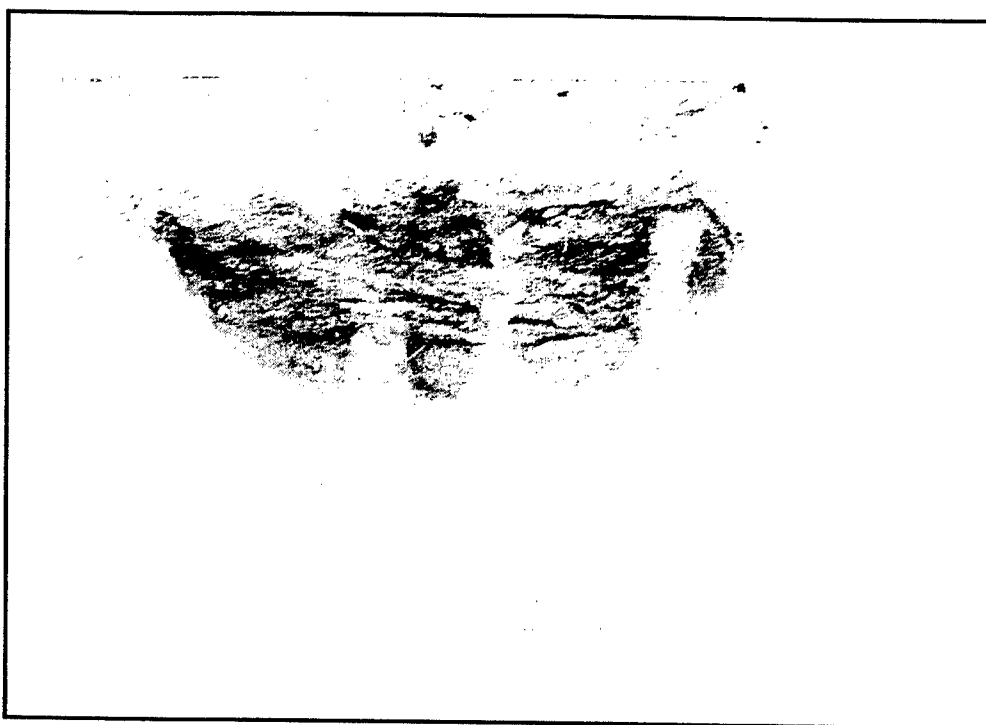


Figure 3.19. Cross-sectioned postmolds (Feature 137).

Floor

The floor of the dugout is defined by a 7-15 cm thick, dark brown layer (sandy clay loam 10YR 3/3 or 10YR 3/2) that contained a concentration of artifacts, charred wood, charcoal, mortar, bricks, and stone (e.g., Figure 3.20). This layer was underlain by a mottled subsoil, a 5-10 cm thick, dark grayish brown sandy clay loam (10YR 4/2) mottled with yellowish brown (10YR 5/4) clays and sands that contained only a few artifacts, and these were probably moved there by natural forces. This mottled subsoil was underlain by a culturally sterile yellowish-brown (10YR 4/2) clay loam.

Further evidence for the floor level consisted of a considerable number of complete square (cut) nails, found still positioned upright in the ground in the mottled subsoil (Figure 3.16). One of the upright nails was actually a spike measuring 6 in. while the other nails measured in the 2-4 in. range. Most of the nails were arranged in two distinct almost parallel rows, and this patterning is suggestive of evidence of wood flooring in the front half of the dugout. At Fort Edward, an 18th century military post in New York, rows of upright nails in the floor of a hut were interpreted to have been the only surviving evidence for securing wooden floor boards to joists set directly on the ground (Howe 1995:45-47). At an excavated dugout at Fort Larned, Kansas, a badly decayed six ft. long 2 x 4 with upright nails spaced at irregular intervals along the length of the wood was interpreted to be a floorsill or joist to which wood flooring was nailed (Scott 1975:68). At Dugout 10, no stains or actual pieces of joists or wood

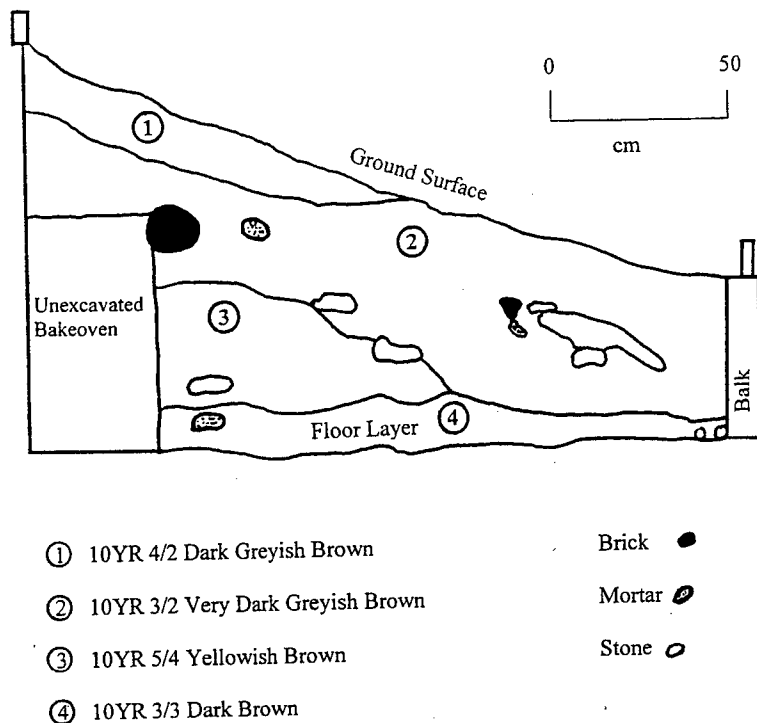


Figure 3.20. Profile of south wall of unit x-5.

flooring could be identified, still the patterning of nails suggests that wood flooring may have covered at least a portion of the front half of the dugout.

Other possible evidence of a floor covering comes from units x-104 and x-107 along the south wall of the dugout. Here, five fragments of rubberized cloth (one having a brass grommet still attached) were recovered from the floor level of the dugout. This material probably represents the remains of rubberized ponchos or ground cloths, items issued in large numbers to Civil War/Indian Wars troops (Fox, Chapter 4). At Fort Zarah, grommets found in place on the floor of an excavated dugout were interpreted to be evidence that the floor had been covered with a tarpaulin (Lees 1989:36). Whether the cloth was used as a floor covering is not clear, but its presence at the floor level of the dugout is suggestive.

At the front of the dugout, the floor lies only 32 cm (southwest corner) and 20 cm (northwest corner) below the present surface. At the back of the dugout, the floor lies 147 cm (southeast corner) and 138 cm (northeast corner) below the present surface. Clearly, the wooden structure of the dugout was semi-subterranean, because even at the back of the structure the maximum depth of 147 cm (less than 58 in) would not have been deep enough for a man to stand erect. The amount of floorspace in the dugout is approximately 21.73 m, calculated by determining the minimum inside distance: (1) between the two sidewall footing trenches for width (4.26 m or 14 ft.), and (2) between the front footing trench and the rough-dressed stone bakeoven front for length (5.10 m or 16 ft. 9 in.).

Internal or Roof Supports

Four features (138, 142, 144, and 146) extending into the sterile subsoil beneath the floor of the dugout indicate the locations of support posts for internal walls, or perhaps more likely the roof (Figure 3.16). The boundaries of all four were defined by large dark stains, squarish in shape. Feature 138 measured 29 x 29 cm and 12 cm in depth. Feature 142 measured 39 x 37 cm and 12 cm in depth. Feature 144 measured 26 x 23 cm and 13 cm in depth. Feature 146 measured 30 x 25 cm and 35 cm in depth.

Interestingly, three of these postmolds proved to be more than stains. Features 144 and 146 contained mortar fragments, suggesting that the posts may have been mortared in place. Feature 144 also contained ash, brick fragments, a glass seed bead, and a rodent tooth. Additional items in Feature 146 included charcoal, 5 cut nails, and a two-piece brass general service button. Feature 142 was, by far, the most interesting, containing a variety of metal, glass, ceramic, and rubber artifacts (Figure 3.21). A flotation sample from Feature 142 produced charred remains from *Chenopodium*, *Curcubita*, and *Euphorbia*, and uncharred specimens from *Zea mays* and nutshell (Adair, Chapter 6). The quantity and variety of materials from Feature 142 suggest disposal activity after the post was removed.

Bakeoven

The bakeoven is represented by six features (110, 119, 124, 125, 134, and 148) Table 3.6). These include intact portions of the oven (Feature 119) and fire/ash box (Feature 148) as well as features associated with the bakeoven's use (Features 125 and 134), and ultimate collapse (Features 110 and 124).

Feature 110, initially exposed in x-2 (Trench B) at 40 cm below the surface, was the first indication of a collapsed brick structure (Figure 3.22). It consisted of whole and broken bricks, mortar, and sandstone. The bricks appeared to be hand-formed of local clays and sand. Some of the mortar exhibited flat surfaces with a creosote coating. When found, Feature 110 was thought to be rubble from a collapsed chimney, however further excavation revealed it to be rubble from the collapsed bakeoven. Fall debris from the bakeoven was also recorded as Feature 124 (Figure 3.16). It consisted of a mixture of sandy loams and clays, large sandstone rocks, brick, mortar, and charcoal within units x-110 and x-5 (Trench A) at the front of the oven. Feature 124 extended to the floor of the dugout and is interpreted to be fall from the partially collapsed bakeoven.

Feature 119 consists of the intact remains of the arched brick bakeoven. The entire front portion of the bakeoven had collapsed, but surviving elements include approximately 75% of the brick and mortar footing and 60% of the baking surface (Figure 3.23). Evidence indicates that the bakeoven was built directly on the culturally-sterile sandy loams and sands. Then, large



Figure 3.21. Excavated postmold (Feature 142) and removed artifacts (foreground).

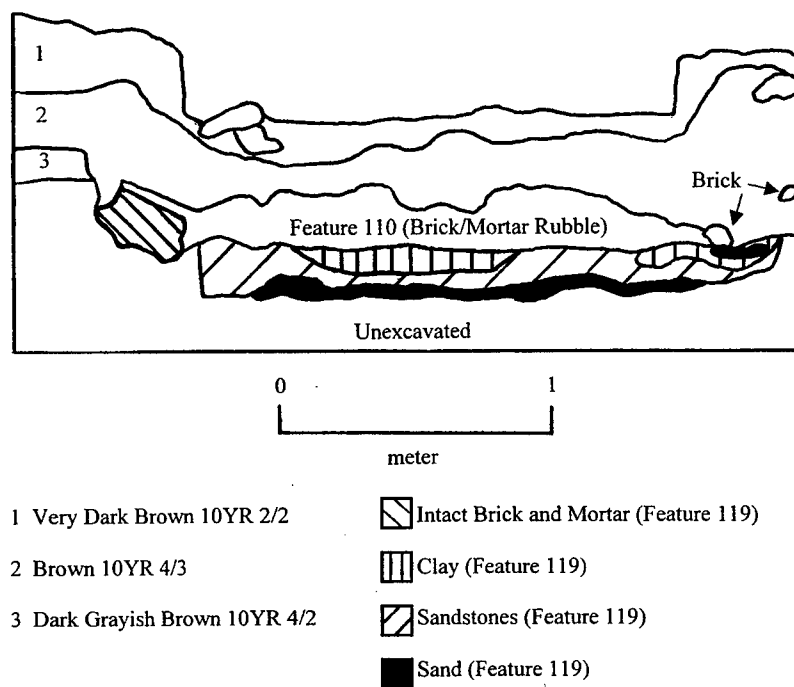
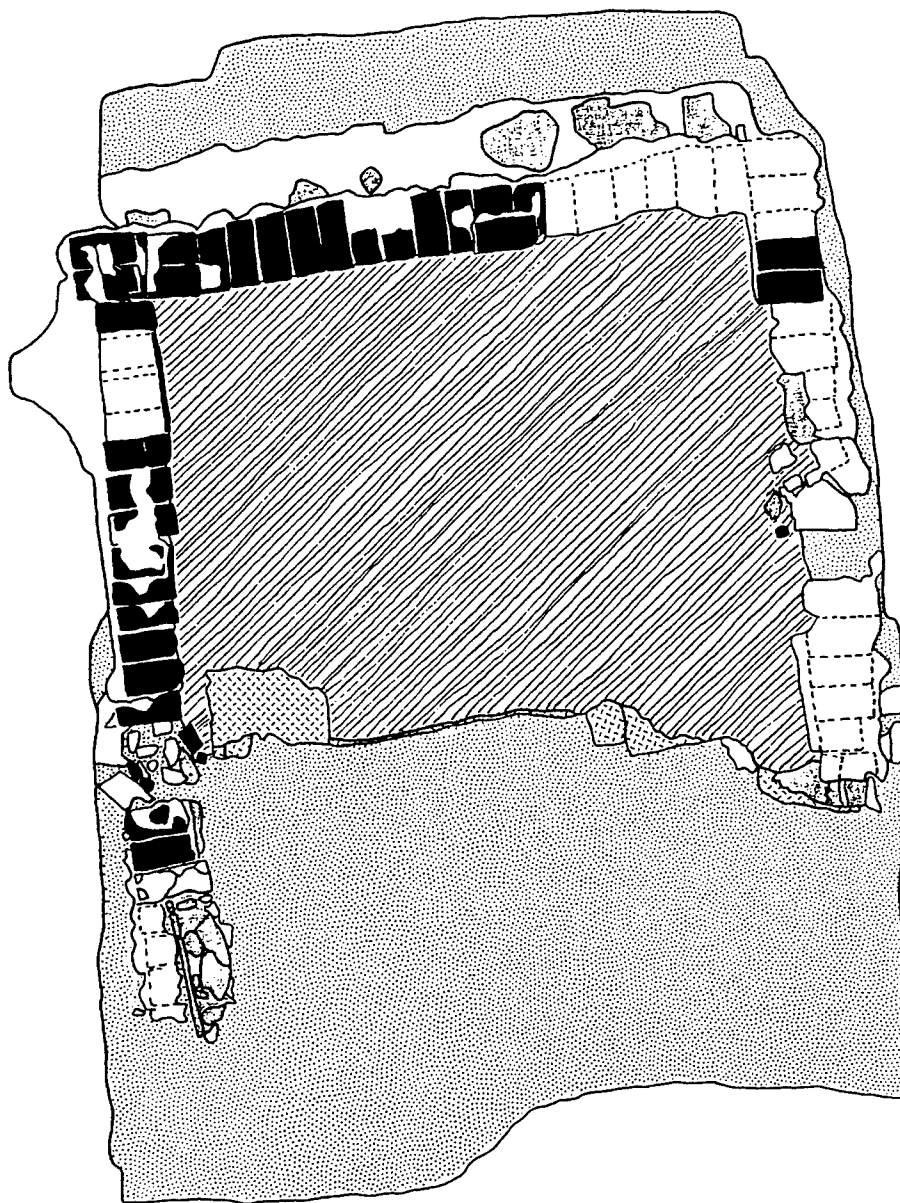







Figure 3.22. East profile showing bakeoven (Feature 119) with overlying brick and mortar rubble (Feature 110).



KEY

-  BRICK
-  MORTAR
-  CLAY LAYER OVER SANDSTONE SLABS
-  SANDSTONE
-  BURNED SANDSTONE
-  DARK BROWN SANDY LOAM



0 1
METER

Figure 3.23. Plan of Feature 119.

relatively flat (approximately 10-25 cm thick) sandstones (dusty red 2.5YR 3/2) were placed horizontally to form the foundation for both the baking surface and arch. This sandstone can be seen protruding from the collapsed portion of the baking surface and extending beyond the mortar footing for the arch. Rough-dressed sandstone was set vertically to form a sandstone front for the bakeoven. The actual height of this front wall is unknown because the upper portion of it had collapsed. The actual baking surface was a 5-10 cm thick layer of clay spread over the flat sandstones. The clay was a combination pale red (10YR 6/3) and light gray (7.5YR 7/2), undoubtedly from its use as a baking surface. Identifiable charred remains from flotation samples from the bakeoven include *Chenopodium* (2), *Zea mays* (2), and nutshell (1) (Adair, Chapter 6). The difference in elevation between the baking surface and the floor level of the dugout was approximately 100 cm, a reasonable height for 19th century soldiers.

Since little of the brick portion of the oven remained intact, details regarding it are rather limited. We know that the width (outside dimension) of the oven was approximately 244 cm (8 ft.); the length is unknown for certain but a measurement from the back of the structure to the sandstone wall at the front is approximately 318 cm (10 ft. 4 in.) Evidence from the two sidewalls indicates that bricks were laid up to form an arch. Greg Jackson, an engineer who served as crew leader at Dugout 10, determined from the still intact base in the north side of the oven (Figure 3.24) that bricks were laid up in the manner shown in Figure 3.25. It consisted of alternating layers of bricks, generally 2 x 4 x 8 in. in size, although the thickness varies from 1 7/8 to 2 1/8 in. Thick amounts of mortar, as well as tapered bricks (made by chipping away a portion of the brick) contributed to the formation of the arch.

Bricks and mortar from Feature 119 quite possibly were made on-site, but presently there is no direct archaeological evidence (kilns) or documentary evidence to support this presumption. The mortar is soft and crumbly, a sand and lime mixture typical of sites dating to this time. The bricks are crude, uneven in shape, soft in texture, and generally reddish yellow (7.5YR 7/6) in color. Some specimens exhibit grass impressions, perhaps from being set out on the prairie to dry. Several specimens examined by the current plant manager of the Acme Brick Company in Kanopolis were described as being hand-formed (probably of local clays) and unfired, although possibly heated at a low temperature to dry (Clint Branch, pers. comm., 1996).

Feature 148 consists of the remains of a fire/ash box, located to the left and below the surface of the bakeoven (Figures 3.16 and 3.26). It was originally built into the rough-dressed sandstone front of the bakeoven, however due to the collapse of that part of the bakeoven only the bottom portion of the fire/ash box (three sides and bottom) remained intact. Feature 148 measures 64 cm wide and 60 cm deep, and its bottom was constructed approximately 33 cm above the floor of the dugout. The sides and back are rough-dressed sandstone, while the bottom consists of a combination of sandstone and brick, covered with a thin layer of hard-burned clay and earth. A small fragment of a grate was still attached to the stone on the right side of the fire/ash box, approximately 36 cm above the bottom. Analysis of a flotation sample from the feature indicates a mix of charred unidentified grass fragments (some displayed characteristics

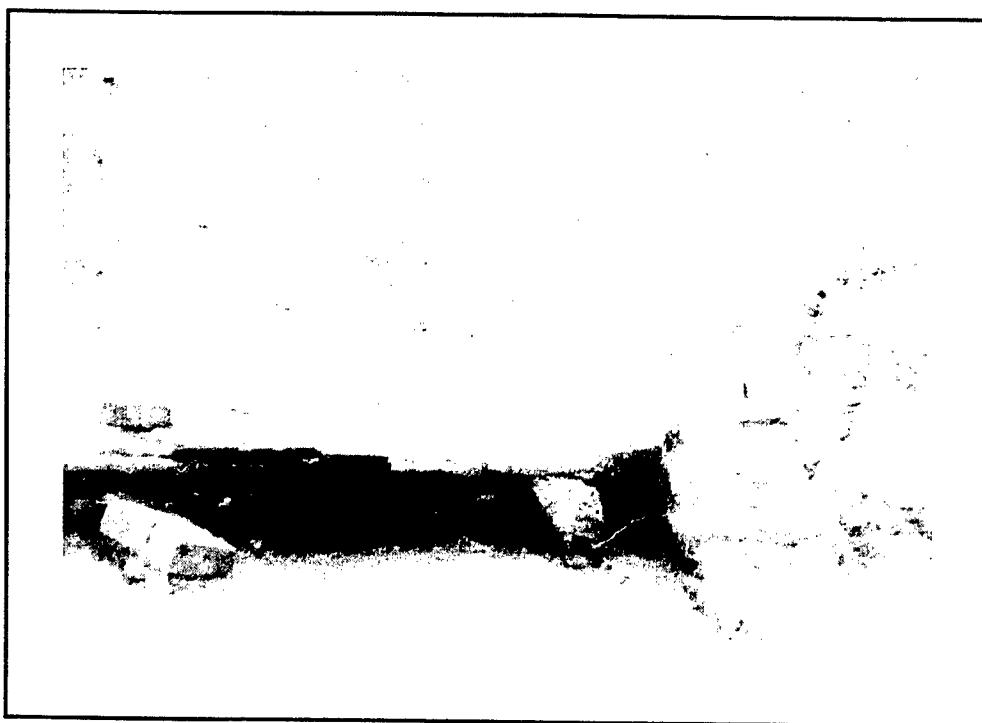


Figure 3.24. View of remains of arch (northeast corner).

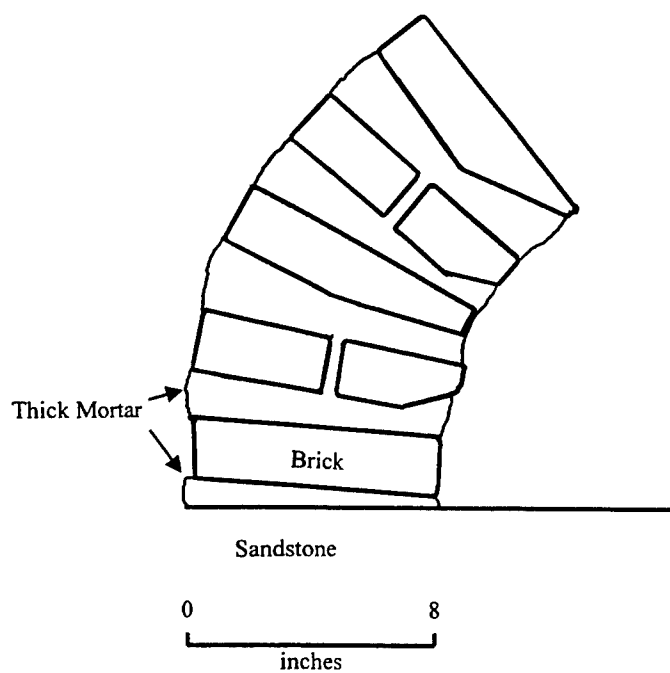


Figure 3.25. Schematic of cross-section of arch.

similar to wheat), extremely charred organic residue, and 11 fragments of plum or cherry pits (Adair, Chapter 6).



Figure 3.26. Feature 148, the fire/ash box.

Feature 148 served as the means for maintaining the proper baking temperature in the bakeoven. According to Jeff Sheets, who has baked bread in the reconstructed oven at Fort Larned, the process of firing the bakeoven is as follows. First, logs are fired in the bakeoven. Second, after the proper temperature is reached, the unburned wood, charcoal, and ash are removed from the bakeoven. Finally, a fire is started in the fire/ash box (which is connected to the bakeoven by ductwork) to maintain the heat in the bakeoven to the proper baking temperature (Jeff Sheets, pers. comm., 1999). The remains of the grate in Feature 119 suggest that the logs would have been placed on the grate for firing; small bits of charcoal, unburned wood, and ash would have fallen through the grate to the bottom of the fire/ash box where they would have been cleaned out periodically by the bakers. No evidence of the duct work was found, but this is understandable since the upper portion of the fire/ash box and the front of the oven had collapsed and any such evidence may just have been unrecognizable in the rubble remains.

Features 125 and 134 likely resulted from the use of the bakeoven. Feature 125 is a piece of burnt wood measuring 14 x 14 x 10 cm, recovered from a sandy loam deposit approximately 12 cm above the floor of the dugout and adjacent to the fire/ash box (Figure 3.16). Adair

(Chapter 6) suggests that the wood is *Celtis*, or hackberry, a dominant species along the Smoky Hill River and Spring Creek. Feature 134 was a 10-20 cm thick blackened layer of charcoal and ash on the floor of the dugout adjacent to the bakeoven (Figure 3.16). Its location and thickness suggest that it came from the bakeoven in one episode, probably after the collapse of the front portion of that structure.

Nonstructural Features

Three artifacts thought to have particular significance were assigned feature numbers (112, 117, and 135), recorded three-dimensionally, and mapped. Feature 112, originally identified as a single relatively large (19 x 11 cm) piece of dark gray canvas, was recovered from x-107 at 40 cm below the present surface of the ground in a cultural deposit containing brick and other construction materials resulting from the collapse of the bakeoven. Fox (Chapter 4) identifies this material as rubberized cloth, possibly from ponchos or ground cloths issued by the Army. Feature 117 consists of two pieces that refit to form most of a large, 1/8 in. thick cast rectangular iron roast/bake pan. Feature 117 was recovered from x-108 at a depth of 96 cm below the present surface of the ground in deposits that represent the collapsed north wall of the dugout. Fox (Chapter 4) indicates that the size of the item (21 3/4 in. x 10 3/16 in.) suggests that it was used for communal food preparation. Feature 135 was recovered from x-105 at 263 cm below the reference stake for the dugout in deposits considered to be the floor of the dugout. This item was originally thought to be the handle of a sword, however Fox (Chapter 4) identifies it as a hunting knife.

The last feature to be discussed in this section is Feature 118, originally thought to be a postmold. It was 14 cm in diameter and extended from 112-118 cm below the present surface of the ground in x-108. This possible feature was cross-sectioned and found to be a rodent disturbance.

Artifacts

Richard Fox (Chapter 4) describes in detail the entire Locality 6 assemblage and tabulates the artifacts by major proveniences in Appendix D. The following is a brief summary and discussion of the more than 1,700 artifacts recovered from Dugout 10. All major categories of artifacts are represented including construction materials, hardware, military equipment and accouterments, ammunition and related items, apparel and accouterments, personal items, ceramics, tin cans, glass containers, and other miscellaneous objects (Table 3.7). The hardware category, which included many cut nails, contained by far the most artifacts. Combined, cut nails, bricks, mortar, and window glass comprise more than 1,200 of the more than 1,700 artifacts recovered.

Eighteen artifacts attributable to the U.S. military were recovered: a canteen stopper, a knapsack adjustment hook, a knapsack triangular ring, a knapsack or infantry cartridge belt strap hook, eight strap studs used on various military belts and straps, a saddle guard plate, and five line-eagle device general service buttons. General service buttons of this style and size (3/4 in.) were used on the tunic of enlisted men between 1851-1884 (Fox, Chapter 4). The other items were adopted by the Army in the 1840s-1850s and continued to be used until 1872-1873, the only exception being the canteen, which could have been used as late as 1898 (Fox, Chapter 4). All of these items, except the buttons, were components of the uniform, accouterments, or personal gear issued to both enlisted men and officers (Steven Allie, pers. comm. 2000).

Table 3.7. Artifact Counts from Dugout 10

Artifact Category	Count
Construction	390
Hardware	1017
Military	18
Ammunition	34
Apparel and accouterments	44
Personal	53
Ceramics	26
Containers (tin cans)	15
Containers (glass)	120
Other glass	9
Other metal	1
Unidentified non-metallic	1
Total	1728

Although few items were actually classified as military items, there are many more items that cannot definitely be identified as military issue but have a good probability of deriving from the 1860s military presence. Among these items are cartridge cases for the Spencer rifle/carbine, and .56-.58 cal. bullets probably used in Civil War era muskets or rifled muskets, two-piece iron buttons, rubberized cloth, grommets, and personal mess gear. Such items have been recovered from other contemporaneous Civil War/Indian Wars forts and campsites (Crass 1990; Herskovitz 1978; King 1997, 1999a, 1999b; Legg and Smith 1989; McBride and Sharp 1991).

Recovered ammunition and related items include cartridge cases, bullets, primers for rifles/muskets and pistols, lead shot bar fragments, and lead sprue from making ammunition. All but two of the identifiable cartridge cases and bullets represent weapons that were in use by the early 1860s. The first is a .22 cal. cartridge case impressed with an "F", and the second is a .22

cal. cartridge case impressed with "U HI SPEED"; both date to the 20th century (Fox, Chapter 4). These were recovered from shallow proveniences and are clearly post-occupation additions.

Artifacts other than those categorized as military or arms/ammunition also are consistent with an 1860s occupation. Apparel and accouterments include buttons of milk glass, shell, iron, rubber, and pewter, as well as rubberized cloth fragments, hooks and eyes, grommets, footwear fragments, heel/toe plates, shoe nails, and eyelets. Personal items include straight pins, chalk, pencil lead, pen/pencil fragments, beads, a cone tinkler, a concha, coin purse frame fragments, a brush handle, a bobby pin, mirror sherds, and a comb tooth. Among the eating and cooking items are knives, forks, spoons, pot/cup handles, a roast/bake pan, a pewter leg, a jack knife, and a hunting knife. Ceramics are plain or molded whiteware. There are various containers represented by tin can fragments and lids, bottle bases, glass body sherds, and a glass bottle stopper. Four sherds are from a bottle of Davis' Painkiller, a 19th century concoction, while a complete perfume/prescription bottle is otherwise unidentifiable (Fox, Chapter 4).

Evidence of women in the archaeological record usually is difficult to identify because most activities cut across sex lines (Starbuck 1994). There is sewing paraphernalia consisting of a thimble, straight pins, and a piece of chalk identified by Fox (Chapter 4) as possible tailor's chalk. These however, are not convincing evidence of women because many Civil War era soldiers mended clothing and carried a small sewing kit known as a "housewife" for such purposes (Lord 1963:130-131). Other items are somewhat more convincing: a bobby pin, two fragments of a coin purse, and 27 small seed beads. The latter was a popular 19th century frontier trade item but also was used on women's apparel and accessories. Finally, there is a pewter button. Fox (Chapter 4) notes that pewter was popular on men's wear before the early 19th century, but after the middle of the 19th century it was popular on women's wear.

Construction materials include whole bricks, brick fragments, mortar, lime, fieldstone (sandstone), sheet metal strap, sheet metal fragments, and window glass. In addition to the items above classified as construction materials, many of the hundreds of recovered cut nails likely served construction purposes as well. It is notable that brick was used exclusively in the construction of the bakeoven and not in the dugout walls. It should also be noted that the 210 fragments of window glass were nearly evenly distributed in the front half (n=101) and the back half (n=109) of the dugout, so it is not possible to say with certainty where windows were located. Perhaps there was a window at or near the southwest corner of the dugout, since 92 sherds were recovered from three units (x-112 through x-114) there.

Overall, the artifact assemblage supports an 1860s military occupation. The only exceptions are items discussed above, from surface or near surface contexts. Negative artifactual evidence suggests that the bakery may not have been used after 1867. In particular, there is no artifactual evidence for the Model 1866 .50 cal. Allin conversion Springfield rifle, a converted .58 cal. Springfield in use by the Army even in more remote western frontier locations by 1867 (Fox, Chapter 4). Documentary evidence supports this date. In February 1867 the bakeoven was reportedly "almost entirely unserviceable and irreparable" and preparations were underway to

build a bakery at Fort Harker (NA 1865-1869:A. Gibbs to M. Morgan, 7 February 1867). Apparently the old oven was not used for more than a few months afterwards because the buildings at Fort Ellsworth were ordered razed to the ground in June 1867 (Choitz 1967:7).

Three prehistoric pottery sherds were recovered. All came from shallow proveniences, between 20-40 cm below the surface, and are likely associated with the Smoky Hill component on the Knoll.

Faunal Remains

Vertebrate remains excavated totaled 259 specimens, of which 100 were complete enough to identify. Identifiable specimens include domestic as well as wild forms (Bozell, Chapter 5). Sixty-two of the 100 identifiable specimens represent a minimum of two cottontail rabbits. Specimens of domestic species (swine, cattle, and chicken) are represented as well, but in much smaller numbers.

Shell includes eggshell and unidentified gastropods. Eggshell totals 449 fragments, which Bozell (Chapter 5) suggest are probably from chickens. It is also important to note that no mussel shell was recovered in Dugout 10; in fact it occurs exclusively on the Knoll. Bozell (Chapter 5) suggests that its presence there is probably due to the Smoky Hill component.

Archaeobotanical Remains

Adair (Chapter 6) provides a complete discussion of the analyzed archaeobotanical remains from the dugout. Flotation samples from features 119, 124, 142, 145, and 148 discussed above produced a mix of domesticated and wild species. Particularly noteworthy is the fact that potential food remains were directly associated with oven features. Feature 119, the bakeoven, contained charred kernels of corn and nutshells, while Feature 148, the firebox of the bakeoven, contained some fragments resembling wheat, and fragments of plum or cherry pits.

Material Remains and Site Formation Processes

A complete study of the horizontal and vertical distribution of more than 1700 artifacts and more than 700 faunal and floral ecofacts recovered is beyond the scope of the present study. Nevertheless, a few general observations offered below are based upon a thorough review of field notes, feature forms, excavation level forms, and catalog records.

Of some 1,700 recovered artifacts, more than 1,100 are construction and hardware items (nails, window glass, bricks, and mortar) that likely represent remains of the bakeoven and dugout. Bricks and mortar were recovered primarily from the southeast quadrant of the block excavation, the location of the collapsed arch of the bakeoven. Nails, on the other hand, were found throughout the block excavation, and likely were associated with the wooden framework

of the dugout. A dispersed nail distribution such as this often results from a phenomenon referred to as "nail rain." Nail rain results from factors such as building repairs, the expansion and contraction of building materials due to temperature fluctuations, and finally, building decay and collapse (Crass 1990:61).

The remaining 600 or so artifacts are non-structural types, recovered from every excavation unit but predominately at vertical elevations on or near the floor of the dugout. Many of the smaller artifacts such as personal items or military accouterments could have been lost or perhaps discarded while the dugout was in use. Others, such as bottle glass and tin cans are more suggestive of materials disposed of at the time of abandonment of the structure but before it had collapsed. Certainly items such as broken glass and sharp fragments of tin cans would have been a liability on a living floor.

Faunal remains were rather sparse (only 259 vertebrate specimens) and widely dispersed throughout the dugout (there were no concentrated accumulations or features), predominately at vertical elevations on or near the floor of the dugout. Presumably at least some of the bones were the result of meals consumed in the dugout or discarded there shortly after the structure was abandoned but before it had collapsed.

In sum, the deposits at Dugout 10 are viewed as reflecting the behavior of those who worked at the bakery as well as others who frequented the dugout. There is no evidence that the collapsed dugout was used as a convenient dumping place for trash and garbage generated elsewhere at Locality 6. Moreover, there is no evidence, in the form of time-sensitive artifacts or documents, that residents or civilian employees of Fort Harker discarded items at Locality 6 after mid-1867. It is unlikely that trash and garbage were hauled a mile from Fort Harker and dumped at Locality 6 when there were numerous suitable places much closer to the post along Spring Creek and elsewhere.

Summary of the Physical Evidence of the Dugout

For the most part, the dugout and bakeoven were constructed of raw materials that could have been obtained from the local environment. Nails, other miscellaneous hardware, and window glass are the exceptions. Fox (Chapter 4) discusses issues related to construction artifacts and the Army's ability and willingness to supply them to Fort Ellsworth.

Based upon the archaeological evidence we know that the dugout had a front wall and two sidewalls constructed by setting logs endwise in a trench. There appears to have been at least one window near the southwest corner of the dugout. Little is known about the roof, except for some possible roof supports. Inside, wood and/or rubberized cloth may have been used as a covering on the excavated earthen floor of the dugout. The most imposing feature of the dugout, the bakeoven, was constructed from local materials using considerable care and expertise. Its importance is highlighted by the fact that it was the only structure of those excavated at Locality 6 where bricks were used as construction material.

Excavations at Depression 13

The depressions at Locality 6 are located along the highest terrace scarp of the Smoky Hill River. In the vicinity of Depression 13, the difference in elevation between the base and the highest point of the scarp is approximately 3 m (Figure 1.3). On the surface, the actual physical depression measured approximately 8 m along its longer, northeast-southwest axis, and 6 m along its shorter southeast-northwest axis (Figure 1.3). Depth varied across the depression but did not exceed 1.0 m. Time and resources did not permit complete excavation of the dugout at Depression 13, however I believe that enough data has been recovered to make sound inferences regarding its form, dimensions, means of construction, and function. (Note: hereafter the term "Depression 13" will be used to refer to the physical surface depression resulting from the collapse of the dugout while "Dugout 13" refers to the physical remains of the dugout and associated deposits; feature numbers were assigned to Depression 13 (Feature 103) and Dugout 13 (Feature 113), however in subsequent discussions the former terms will be used).

Although the long axis of the depression was oriented northeast-southwest, actual orientation of the block excavation was True North, the same orientation for all excavation units except for those at Depression 10 (Figure 3.2). To expose the dugout and associated cultural deposits, ten 2 x 2 m squares and one 1 x 2 m square were excavated in a block (Figures 3.27-3.28) (TU 8, a 5 x 5 ft. test unit excavated in 1995, fell primarily although not entirely within N442 E504). Eight of the units within the block were excavated to sterile soil. Time did not permit the excavation of three units to sterile soil-- N442 E504, N446 E510 (2 x 2 m units) and N444 E512 (1 x 2 m unit). In addition to the block excavation, one 2 x 2 m unit (N440 E501) was placed on gently sloping ground in front of the dugout. Time also did not permit this unit to be excavated to sterile soil.

Dugout 13

Overview

Initial definition of the precise limits of the dugout was not possible because both the natural soils and cultural fills were dark colored. But at approximately 30-40 cm below the surface, the 1860s cut into the terrace scarp was clearly defined by a distinct interface between darker-colored cultural fills within the feature and lighter-colored sterile soils beyond. Deposits within the feature consisted of dark brown or dark grayish brown sandy clay loams containing many artifacts. In contrast, soils outside of the feature consisted of culturally-sterile, yellow-brown sandy loams or sands.

The exposed dugout measured (outside dimension) 6.29 m (20 ft. 7 in.) along the long axis and an estimated 4.71 m (15 ft. 6 in.) along the short axis (Figure 3.29). A line of postmolds within a trench defined the actual location of the front wall of the structure. Although the distinct interface between sterile soils and cultural fill defined the 1860's cut, no direct evidence of side

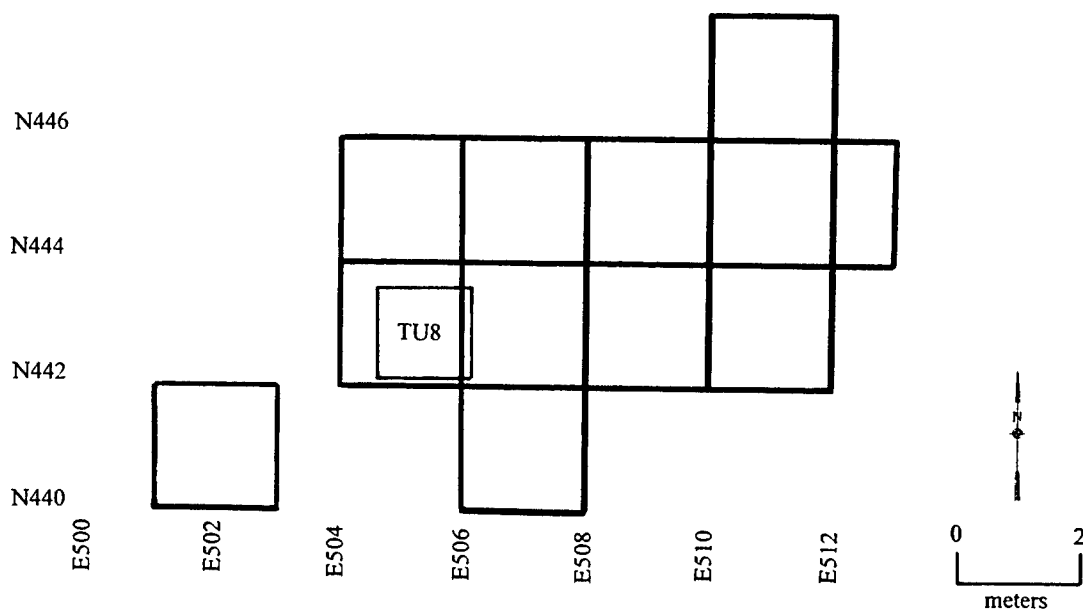


Figure 3.27. Block Excavation at Dugout 13.

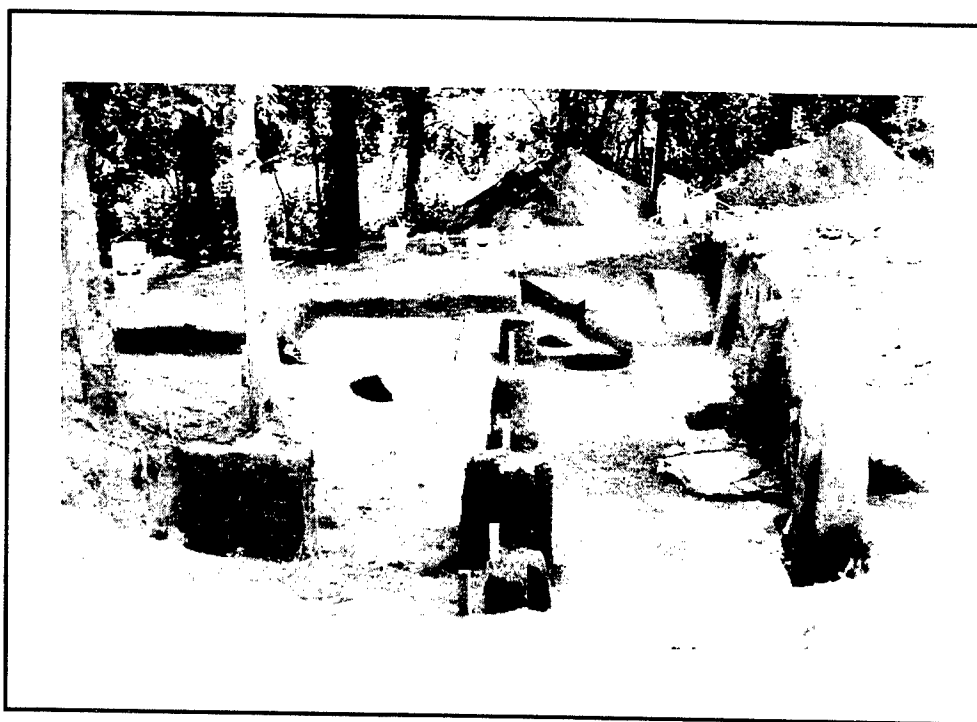


Figure 3.28. View, looking west, of nearly completed block excavation at Dugout 13.

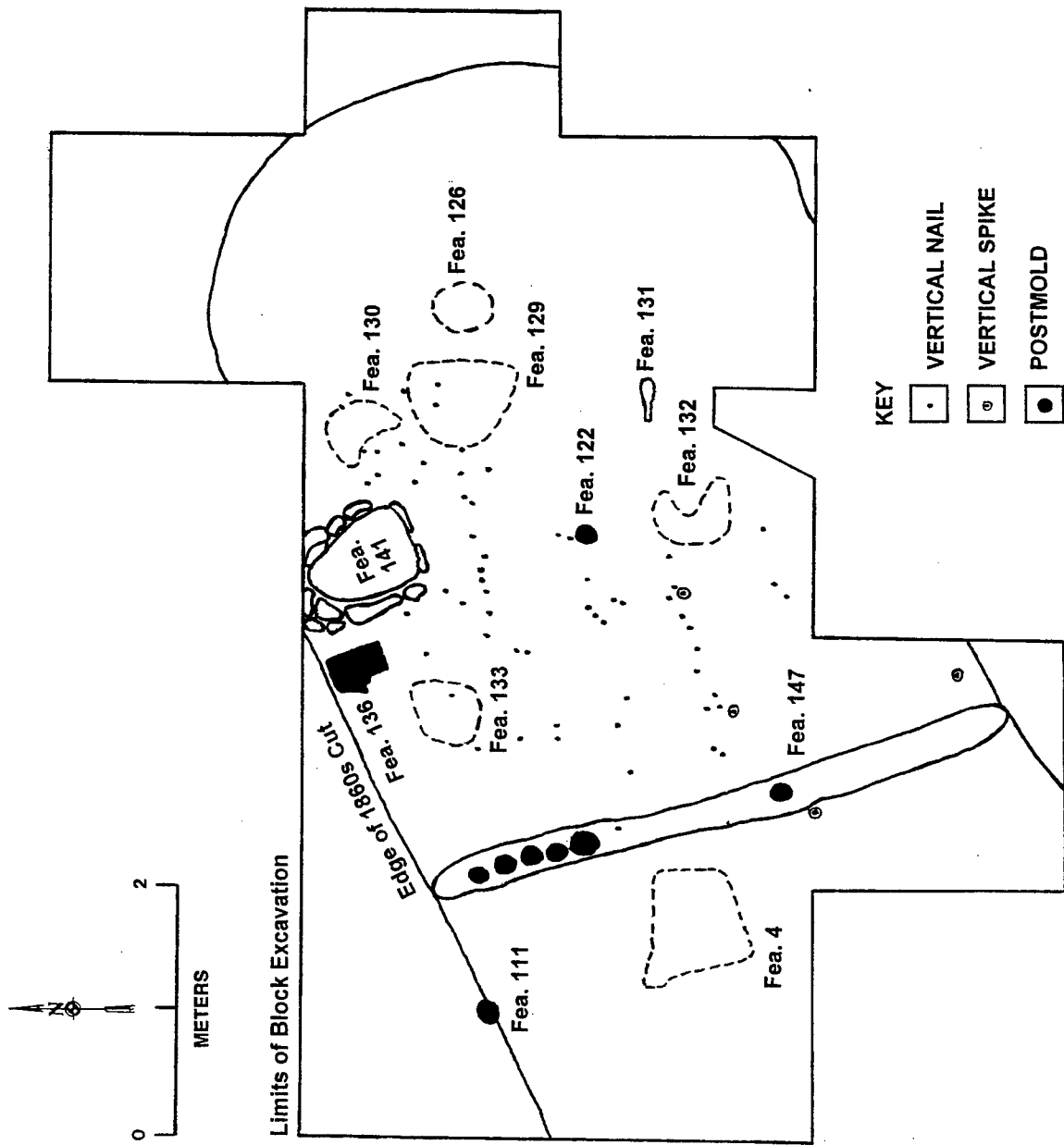


Figure 3.29. Plan of excavated floor of Dugout 13.

and back walls was evident. Other elements of the dugout included a hearth, interior postmolds, and an intact portion of the clay floor. A summary (Table 3.8) as well as detailed descriptions of these and other features are provided below.

Structural Features of the Dugout

The front wall of the dugout is indicated by Feature 147, interpreted as a wall trench in which upright timbers had been set (Figure 3.29). Feature 147 initially was identified as three separate dark brown soil stains (Features 114, 128, and 140) but further excavation revealed that these three were one continuous stain across the front of the dugout. Feature 147 was ultimately defined as a trench measuring 5.5 m long, 30-35 cm wide and 35 cm deep. Identified within the trench were six distinct postmolds, darker in color than the trench fill, and varying in diameter from 16 to 26 cm (Figure 3.30). Cross-sectioning of the postmolds indicates that they were flat-bottomed. A soil flotation sample that included fill from two of these postmolds produced sunflower, purslane, and poppy seeds, along with uncharred seeds of pigweed, and goosefoot (Adair, Chapter 6). The trench fill at the south end of Feature 147 contained cultural debris consisting of a metal grate of flat iron stock (Feature 115), measuring 27 x 23 cm, and 170 unidentifiable fragments of animal bone, three cattle bones, and two swine bones.

The front wall of the dugout was actually inset, creating wing walls of earth that jutted out on both sides of the dugout (Figure 3.29). At the front wall of the dugout, the height of the north wing wall was about 80 cm and that of the south wing wall was 40 cm. An irregular-shaped postmold (Feature 111), measuring 28.5 cm (E-W) and 20 cm (N-S) in diameter, and 25 cm. in depth was set partially into the north wing wall (Figure 3.29). Fill of this postmold included a rock, two sherds of flat glass, charred goosefoot and purslane seeds, and uncharred *Galium* and *Euphorbia* seeds (Adair, Chapter 6). This feature may represent a post that was set there to help stabilize the wing wall.

The floor of the dugout was reached at depths ranging from 128-133 cm below the surface at the very back of the structure. In the back 1/3 of the dugout, the floor (Feature 116) was a hard packed yellowish brown (10YR 5/4) clay roughly 5-12 cm thick (Figure 3.31). In unit N442 E510, an 1865 Indian head one-cent coin in extremely fine condition (Yeoman 1992) was found embedded in the clay floor. In the front 2/3 of the dugout, the floor was a clay mix rather than a distinct clay layer, however, a sizeable number of upright cut common nails (3 in.) and three large (6 in.) spikes made definition of the floor level relatively easy (Figure 3.29). The function of the spikes is not clear; one possibility is that they were used to anchor walls or partitions. Likewise, the precise function of the nails is unclear; some appear to have been set in lines while other are more randomly placed. Evidence of wooden floor joists or flooring was absent. Fragments of rubberized cloth and grommets were recovered from the dugout, but at levels above the floor. Still, the nails are interpreted as surviving evidence that something had been tacked down in that portion of the dugout, whether it be wood, or some other type of material such as rubberized cloth.

Table 3.8 Summary of Features- Dugout 13				
Fea.	Unit(s)	Depth*	Brief Description	Comments
4	TU8	11-41	Bone and artifact complex	Just beyond front wall of dugout
103			Depression 13 defined	Surface depression from dugout collapse
106	442 510	74-95	Bone concentration	In fill above floor of dugout
111	444 505	75-100	Postmold	Beyond front wall of dugout
113			Dugout defined	Dugout 13 remains
114	440 506	50-88	Dark stain	Later determined to be southern extent of front wall trench (Fea. 147)
115	440 506	51.5	Metal grate	Found in front wall trench
116	442 510	133-136	Partial floor of dugout	Clay floor in southeast corner of dugout
120	444 506	80-92	Possible postmold	Determined to be rodent burrow after cross-sectioning
121	442 508	30-46	Stone and bone complex	In fill above floor of dugout
122	442 508	66-75	Postmold	In floor of dugout
123	444 510	124-126	Partial floor of dugout	Clay floor in northeast corner of dugout
126	444 510	133	Ash and charcoal complex	On floor of dugout
127	444 506, 444 508	36-106	Rockfall	Fireplace chimney collapse
128	444 504, 444 506	100-131	Dark stain	Later determined to be northern extent of front wall trench (Fea. 147)
129	444 508	104-107	Burned stone and charcoal complex	On floor of dugout
130	444 508	107	Artifact complex	On floor of dugout
131	442 508	67	Broken bottle complex	On floor of dugout
132	442 508	63	Glass bottle complex	On floor of dugout
133	444 506	95	Bottle complex	On floor of dugout
136	444 506	100-116.5	Large postmold	Located next to sandstone hearth
140	442 506	60-65	Possible doorway threshold	Later determined to be central portion of wall trench (Fea. 147)
141	444 508	107	Sandstone hearth	Along northern edge of dugout
147	440 506, 442 506	65-90	Front wall trench	Encompasses earlier defined Features 114, 128, and 140
	444 504, 444 506			
*All depths below surface				

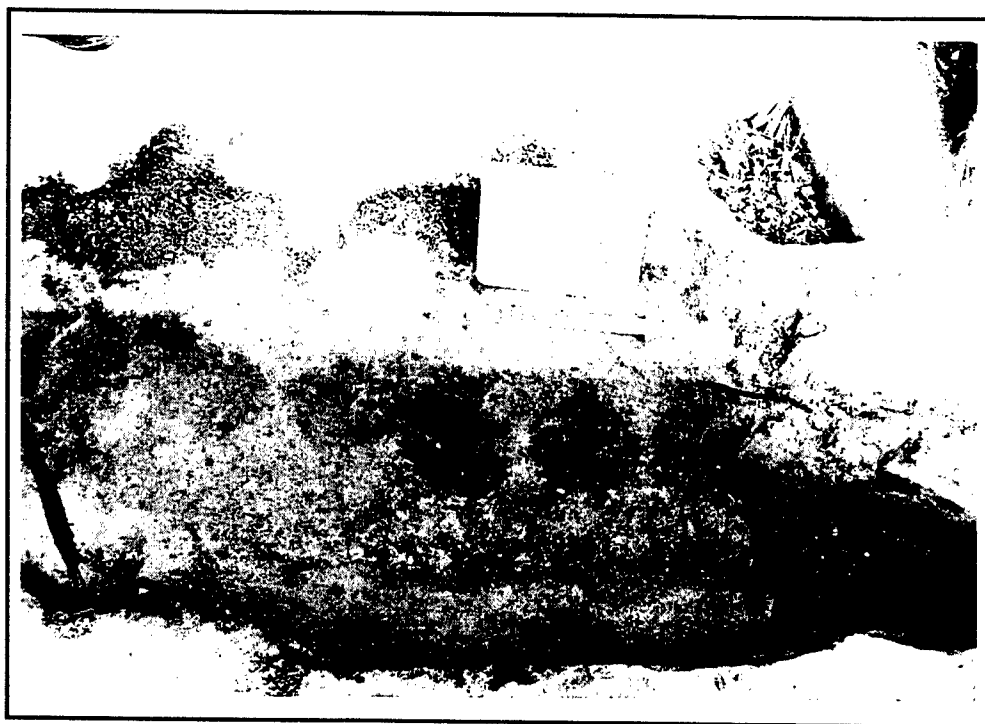
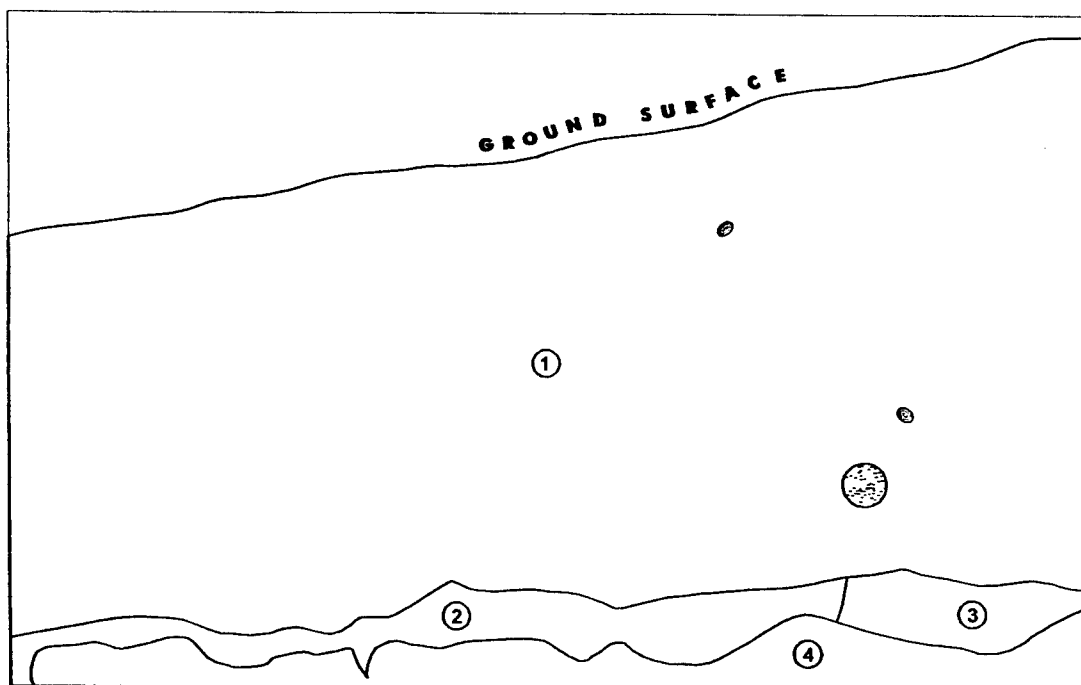


Figure 3.30. Postmolds in Feature 147.

N444
E510



N444
E512

- ① Mottled Fill - Very Dark Grayish Brown 10Yr 3/2 with Dark Brown 10YR4/3
- ② Clay - Yellowish Brown 10YR 5/4 (Floor of Dugout)
- ③ Mixture - Yellowish brown 10YR 5/4 Clay and Pale Brown 10 YR 6/3 Sand (Floor of Dugout)

- ④ Sterile Sand - Pale Brown 10YR 6/3
- ⊙ Roots
- Sand

0 25 50
cm

Figure 3.31. Profile of excavation unit showing floor of dugout.

A hearth (Feature 141), measuring 95 x 77 cm and composed of red sandstone rocks, was set into the floor near the north wall of the dugout in N444 E508 (Figures 3.29 and 3.32). A flotation sample from the hearth produced seeds of goosefoot, sunflower, dock, and spurge. Examination and probing of the north wall of the excavation unit suggested that only the hearth was intact and that the sandstone fireplace and chimney had collapsed. Indeed, sandstone rock (Feature 127) was found on the floor and at various levels above the floor in two excavation units, N444 E506 and N444 E508 (Figure 3.29). These rocks, some having mortar attached, generally measured 30 cm or less in their maximum dimension. They were recovered at depths between 36-93 cm in N444 E506 (top of dugout floor was 100 cm) and 39-109 cm in N444 E508 (top of dugout floor was 107 cm). They are interpreted to be rockfall from the collapse of the fireplace and chimney associated with the hearth (Feature 141).

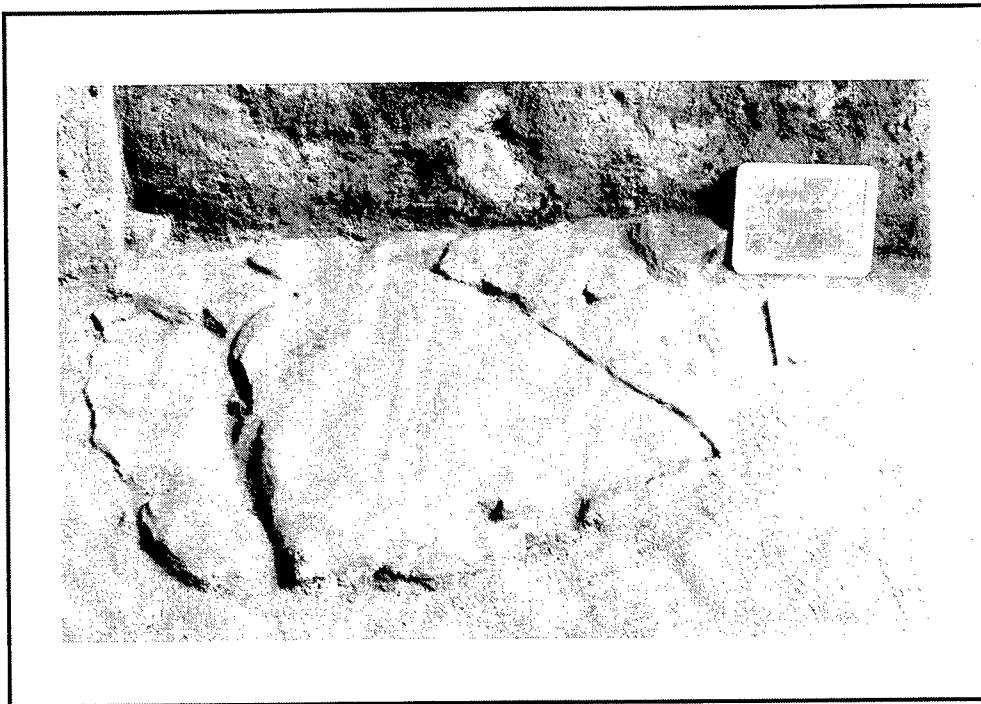


Figure 3.32. Hearth (Feature 141) set into floor of dugout.

Two other features are the only potential evidence for roof support. Feature 122 was a 16 cm diameter dark brown postmold near the center of the dugout (Figure 3.29). Cross-sectioning revealed that the flat-bottomed postmold extended into the clay floor of the dugout. Feature 136 (Figure 3.29) was a large rectangular postmold against the north wall of the dugout near the northwest corner of the hearth (Feature 141). The 43 x 30 cm flat-bottomed postmold also extended into the clay floor of the dugout.

Features on the Floor of the Dugout

Feature 129 was a thin (10 cm) irregular shaped 65 x 25 cm feature on the floor of the dugout consisting primarily of charcoal, ash, burned earth, burned sandstone, and a single fragment of bone (Figures 3.29 and 3.33). In addition, botanical remains including corn kernel fragments, plum or cherry fragments, charred goosefoot and dock seeds, unidentified seed fragments, sunflower seeds, and juneberry or serviceberry seeds were recovered from a flotation sample (Adair, Chapter 6). The feature appears to be the result of food preparation, or possibly cleaning debris from the nearby hearth (Feature 141).

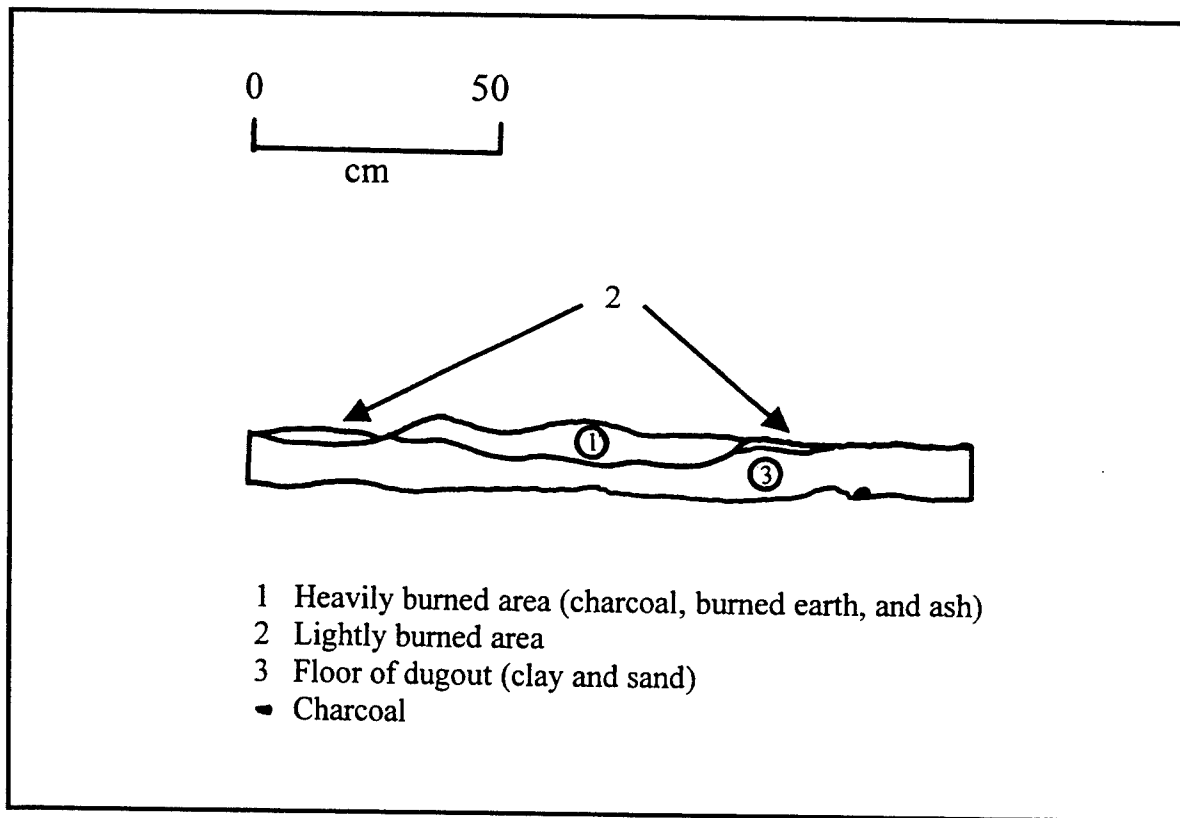


Figure 3.33. Profile of Feature 129.

Features 130-133 consisted of artifacts lying directly on the floor of the dugout (Figure 3.29). Feature 130 was a 75 x 65 cm scatter of broken bottle glass, clay smoking pipe fragments, and cut nails. Feature 131 was a complete, but broken, wine or liquor bottle. Feature 132 was a 50 x 55 cm scatter of broken bottle glass, including two different bottle necks. Feature 133 (Figure 3.34) was a 50 x 40 cm scatter of broken bottle glass and one unbroken peppersauce bottle. The broken pieces included two bases and two necks.

Features 123 and 126 were recorded as two separate features, but they were probably associated (Figure 3.29). Feature 123 was a 10 cm thick layer of sandy loam, sand, patches of charcoal mix, and large pieces of charcoal, centered in unit N444 E510 but also slightly

extending into adjacent units. Initially, Feature 123 was thought to have rested on the floor of the dugout. However, further excavation demonstrated that Feature 123 lay just above the floor and the only remaining evidence of it on the floor of the dugout was Feature 126, an oval-shaped stain containing ash and charcoal, measuring 40 x 30 cm. Feature 126 exhibited no evidence of *in situ* burning of the floor. The charcoal in these features may be the evidence of the burning of structural timbers in this portion of the dugout after it was abandoned.



Figure 3.34. Artifact complex (Feature 133) on floor of dugout.

Feature 4 was a concentration of animal bone and artifacts discovered in TU8 in 1995. Subsequent excavation in 1996 showed that Feature 4 was located just beyond the front wall of the dugout (Figure 3.29). Material was concentrated over an area approximately 100 x 100 cm and extended 11-26 cm below the surface (Figure 3.35). Feature 4 contained a large quantity of butchered animal bone, nails, glass bottle fragments, window glass fragments, glass buttons, small metal lids, a whiteware sherd, a red clay pipe fragment, a suspender buckle, a cartridge case, and a minie ball. There were 240 unidentifiable fragments of bone weighing 450.7 g.; identifiable elements weighing 1051.6 g. consisted of cattle (41), swine (2), domestic chicken (8), and box turtle (3) (Bozell, Chapter 5). Uncharred botanical materials (goosefoot, marshelder, bedstraw, purslane, and unidentified grass) were recovered as well (Adair, Chapter 6). This feature, containing by far the largest concentration of bone found at Dugout 13, suggests that food processing activities occurred there.



Figure 3.35. Bone and artifact complex (Feature 4).

Although no specific feature number was designated, one area outside the dugout deserves mention here. Evidence from excavation unit N440 E501 indicates that artifacts and food remains were deposited on the gradual sloping ground only a few meters beyond the front wall of the dugout. The deposits in that unit, extending from approximately 10-30 cm below the surface, included butchered animal bone, cut nails, bottle glass, whiteware ceramics, a .44 cal. lead bullet, lead sprue, metal lids, mortar, charcoal, and miscellaneous metal. Among the 100 elements of bone (152.4 g.) were those of cattle, swine, chicken, cottontail rabbit, and deer or pronghorn antelope (Bozell, Chapter 5). In all likelihood, the inhabitants of the dugout discarded the materials recovered from the unit.

Features in the Fill Above the Floor of the Dugout

Feature 106 was a concentration of butchered animal bone, miscellaneous metal fragments, and cut nails in the southwest corner of N442 E510. Bone identified from this feature included 15 unidentifiable elements, nine of cattle and four of swine. A flotation sample produced only three charred grass seeds and one unidentifiable seed. Vertically the items were found at various elevations, 75-95 cm below the surface. The floor of the dugout in this square was 128 cm below the surface of the ground, thus the material appears to have been deposited after the dugout had collapsed.

Feature 120 was a small (14 x 9 cm) dark stain in the southeast quadrant of unit N444 E506, extending from 80-92 cm below the surface. The top of the floor of the dugout in this square was 100 cm below the surface of the ground. Cross sectioning of the feature showed that it was a rodent burrow rather than a cultural feature.

Feature 121 was a concentration of sandstone and butchered animal bone in the southeast quadrant of unit N442 E508. This concentration measured about 45 x 45 cm and was located only 30-46 cm below the ground surface. The bone consisted of 13 elements of cattle and 6 of swine. The dugout floor in this square was 78 cm below the surface of the ground, thus the material appears to have been deposited after the collapse of the dugout.

Artifacts

Richard Fox (Chapter 4) describes in detail the entire Locality 6 assemblage and tabulates the artifacts by major proveniences in Appendix D. More than 3100 artifacts were recovered within or adjacent to the dugout (Dugout 13, TU8, and N440 E501). The following is a brief summary and discussion of those artifacts. All major classes of artifacts are represented including construction materials, hardware, military equipage and accouterments, ammunition and related items, apparel and accouterments, personal items, ceramics, tin cans, glass containers, and other miscellaneous objects (Table 3.9). Interestingly, container glass was the most numerous artifact type, followed by hardware, which included many cut nails.

Table 3.9. Artifact Counts from Dugout 13

<u>Artifact Category</u>	<u>Count</u>
Construction	276
Hardware	1210
Military	6
Ammunition	21
Apparel and accouterments	32
Personal	30
Ceramics	18
Containers (tin cans)	93
Containers (glass)	1445
Other glass	55
Other metal	12
Total	3198

Seven artifacts attributable to the U.S. military were recovered: a Springfield rifled musket appendage, a portion of a "bullseye" canteen, a shoulder scale wing stud, a belt catch, a

knapsack strap hook, a regimental number "7" insignia, and a dress hat eagle insignia. Most of these items were adopted by the Army in the 1840s-1850s and continued to be used until 1872-1873, the only exception being the canteen, which could have been used as late as 1898 (Fox, Chapter 4). The regimental number may have come from the uniform of a member of the 7th Iowa Cavalry, stationed at Fort Ellsworth from June 1864-September 1865, or the 7th U.S. Cavalry, stationed at Forts Ellsworth and Harker periodically between October 1866-March 1871 (NA 1965). A majority of these items were components of the uniform, accouterments, or personal gear issued to both enlisted men and officers. However, two of these items were typically issued only to enlisted men. The Springfield appendage, a combination tool (screwdriver/wrench) for the .58 cal. Springfield rifle, was issued to non-commissioned officers (corporals and sergeants), and the wing stud, a device used to fasten the shoulder scale, an accouterment pair issued to enlisted men (privates, corporals, and sergeants) to be worn on their full dress uniform (Steven Allie 2000, pers. comm.).

Although few items were actually classified as military items, there are many more items that cannot definitely be identified as military issue but have a good probability of deriving from the military presence. Among these items is a cartridge case for the Gallagher carbine, and .56-.58 cal. bullets probably used in Civil War era muskets or rifled muskets, primers, iron buttons, rubberized cloth, grommets, a carved rubber ring, and personal mess gear. Such items have been recovered from other contemporaneous Civil War/Indian Wars forts and campsites (Crass 1990; Herskovitz 1978; King 1997, 1999a, 1999b; Legg and Smith 1989; McBride and Sharp 1991).

Recovered ammunition and related items include cartridge cases, bullets, shotshells, shot, primers for rifles/muskets and pistols, and lead sprue for making ammunition. All but one of the identifiable cartridge cases and bullets represent weapons that were in use by the early 1860s. These include a Gallagher cartridge case, a .44 cal. bullet, and two .58 cal. bullets. The lone exception is a .22 "Hornet" case, dating between 1930-1960, excavated from the uppermost level in N444 E510; this same level also produced other 20th century debris including a 12-gauge "New Club" shotshell dating between 1892-1911 (Fox, Chapter 4).

Artifacts other than those categorized as military or arms/ammunition are consistent with an 1860s occupation. Apparel, accouterments, and personal items include milk glass, shell, pewter, and iron buttons, rubberized cloth fragments, grommets, footwear heel fragments, a large sail/packing needle, straight pins, a pen nib, pen and pencil fragments, a carved rubber finger ring, an 1865 Indian Head cent, and clay smoking pipe fragments. Among the eating and cooking related items are knives, forks, spoons, an iron strainer, whiteware sherds, many tin can fragments, and a complete Chaigneau sardine can having an intact paper label. Finally, there are complete bottles of C.H. Swain's bitters, peppersauce, and a conical ink bottle, and embossed sherds of Kelly's Old Cabin and C.H. Swain Bitters, Mexican Mustang liniment, and products of Henry C. Kellogg and Barnhart & Kelly. The embossed bottles, without exception, represent products available by 1866 or earlier (Fox, Chapter 4).

There is scanty evidence, in the form of certain military issue items, for enlisted men. Of course we cannot rule out the possibility that officers and their wives occupied this and other dugouts at times, since the experience of Frank and Alice Baldwin is well documented (Baldwin 1928). Definitive archaeological evidence of officers is absent. Evidence of women is almost nil. There is a pewter button, a type popular on men's wear before the early 19th century, but after the middle of the 19th century it was popular on women's wear (Fox, Chapter 4). Sewing paraphernalia, including a large sail/packing needle and two straight pins, do not provide convincing evidence of women. Many Civil War era soldiers carried a small sewing kit known as a "housewife" (Lord 1963:130-131). Large needles, for repairing heavy cloth used in tents and sails were also carried by soldiers and sailors (Lord 1995:Vol. 5, p.141).

Construction materials are simple and relatively few. These include brick fragments, mortar, lime, fieldstone (sandstone), sheet metal strap, sheet metal fragments, and window glass. The latter, suggests that there was at least one window in the dugout, probably towards the north end of the front wall. Of the 143 flat glass sherds recovered in the block excavation, 126 (88%) came from two units at the front of the dugout, N444 E504 and N442 E504. In addition to the items above classified as construction materials, many of the hundreds of recovered cut nails likely served construction purposes as well. Furthermore, the cut nails, combined with the absence of wire nails, suggest an occupation date before the 1880s.

Overall, the artifact assemblage supports an 1860s military occupation. The only exceptions are items discussed above, from surface or near surface contexts. Negative artifactual evidence suggests that the dugout may not have been occupied, or otherwise used, after 1867. In particular, there is no artifactual evidence for the Model 1866 .50 cal. Allin conversion Springfield rifle, a converted .58 cal. Springfield in use by the Army even in more remote western frontier locations by 1867 (Fox, Chapter 4). Exactly how long this dugout was occupied is unknown. Alice Baldwin (1928:131-132) recalled that she and her husband lived in their dugout until the Hancock expedition reached Fort Harker, documented by Army surgeon Isaac Coates as April 1, 1867 (Kennedy 1997:51). According to another source, in June 1867 the buildings at Fort Ellsworth were ordered razed to the ground (Choitz 1967:7).

A single prehistoric artifact, a flake, was recovered from N440 E506 at 40-50 cm below the surface, and above the floor level of the dugout which was 70 cm below the surface in this excavation unit. This artifact is likely associated with the Smoky Hill component on the Knoll.

Faunal Remains

Vertebrate remains excavated within and adjacent to the dugout totaled 2,994 specimens, of which only 476 were complete enough to identify. Identifiable specimens include domestic as well as wild forms, although cattle, swine, and chicken dominate. The fragmentary nature of the identifiable specimens at the dugout may be due in large part to butchering practices and bone processing. Cleavers (or other chopping tools) were commonly used on cattle and swine bones, furthermore heavily crushed diaphysis shafts on cattle and swine bones may indicate marrow

extraction (Bozell, Chapter 5). That food preparation and consumption was a major activity in the vicinity of Dugout 13 is supported by a number of eating/cooking related artifacts. Such activities would have been carried out indoors or outdoors, in part depending upon the weather and seasons. An 1867 document indicates that enlisted men had neither a kitchen nor mess, and that they cooked and consumed meals in their quarters (NA 1865-1869:E. Otis to J. Davidson, 10 January 1867). Cooking probably took place outdoors, particularly in warmer weather. At Fort Harker, men of the 4th Cavalry were reported to be cooking outdoors (NA 1865-1869:E. Otis to J. Davidson, 10 January 1867).

Shell includes eggshell and unidentified gastropods. Eggshell totals 2,096 fragments, which Bozell (Chapter 5) suggest are probably from chickens. It is also important to note that no mussel shell was recovered in Dugout 13; in fact it occurs exclusively on the Knoll. Bozell (Chapter 5) suggests that its presence there is probably due to the Smoky Hill component.

Archaeobotanical Remains

Adair (Chapter 6) provides a complete discussion of the analyzed archaeobotanical remains. Flotation samples from features 4, 106, 111, 129, 141, and 147 discussed above produced a mix of domesticated and wild species. Identified plant taxa included charred juneberry, poppy, goosefoot, sunflower, plum or cherry, dock, and corn. In addition to samples from features, two samples from general excavation levels (N440 E502 and N444 E508) were analyzed by Adair (Chapter 6), however these produced only grass and unknown seeds, all uncharred.

Feature 129, a burned stone or firebox cleaning complex in the floor of the dugout, is noteworthy because it produced a variety of remains, all charred. Corn kernel fragments, plum or cherry pit fragments, seeds of goosefoot and dock, unidentified seed fragments, sunflower seeds, and juneberry or serviceberry seeds may have resulted from cooking activities in and around the nearby sandstone hearth (Feature 141).

Distribution of Material Remains and Site Formation Processes

A complete study of the horizontal and vertical distribution of more than 3100 artifacts and more than 5,000 faunal and floral ecofacts recovered is beyond the scope of the present study. Nevertheless, a few comments based upon a preliminary analysis are in order. A thorough review of field notes, feature forms, excavation level forms, and catalog records indicates that artifacts and animal bone were recovered from all 12 excavation units at Dugout 13. In other words, material remains were found within the dugout and in the "front yard" beyond its limits. Vertically, artifacts and animal bone were recovered from all excavation levels within eight of the 12 excavation units. In the remaining four units (N440 E506, N442 E506, N44 E506, and N444 E508) no material remains were found in the top 20 cm. Some artifacts

and animal bone were found resting on or embedded in the floor of the dugout, but an estimated larger number was recovered from levels of cultural fill above the floor.

It seems likely that some of the artifacts found resting on or embedded in the floor of the dugout represent use-related primary deposits. These would be items that the residents lost or perhaps discarded while the dugout was occupied. Certainly smaller items such as a one-cent coin and small fragments of personal items or military accouterments fit this category. Charred botanical remains, most specifically those recovered from Feature 129 on the floor of the dugout, likely resulted from cooking activities inside the structure. Other artifacts recovered from the floor of the dugout strongly suggest materials abandoned when the structure was vacated. Broken bottles, for example, in Feature 130-133 would have been a liability on a living floor and were most likely left behind as the structure was abandoned or deposited following abandonment of the structure but before it had collapsed.

A large amount of animal bone deposited in the so-called front yard is thought to represent butchering and bone processing in that area. There were 240 small fragments of bone in Feature 4 alone and it seems unlikely that these were swept up from elsewhere and dumped in front of the dugout.

Non-architectural debris was recovered throughout the fill at virtually every level, suggesting periodic disposal of trash into the depression created by the collapsing structure. Such would have been an ideal place for disposing trash. Trash also could have been placed along the perimeter of the structure when it was occupied, and once the structure began to collapse, it fell or was washed into the voids. It is also probable that some items found in surface levels are secondary deposits washed in from the Knoll above.

In sum, all of the deposits at Dugout 13 may not reflect the behavior of the occupants of that specific dugout. However, they all most likely still do reflect the behavior of those living at Locality 6, probably those still living in close proximity to the abandoned structure. There is no evidence, in the form of time-sensitive artifacts or documents, that items were discarded at Locality 6 after mid-1867 by residents or civilian employees of Fort Harker.

Summary of the Physical Evidence of the Dugout

For the most part, the dugout was constructed of raw materials that could have been obtained from the local environment. Nails, other miscellaneous hardware, and window glass are the exceptions. Fox (Chapter 4) discusses issues related to construction artifacts and the Army's ability and willingness to supply them to Fort Ellsworth.

Based upon the archaeological evidence we know that the dugout had a front wall constructed by setting logs endwise in a trench. There appears to have been at least one window in the front of the structure. The absence of postmolds around the other three sides is perplexing unless the timbers were arranged there in a horizontal fashion and left no stains in

the soil. Alternatively, these sides could have been entirely earthen, but that explanation falls short because the maximum depth of the structure was only 1.33 cm below the surface, hardly deep enough for a man to stand erect. Another possibility is a combination of earthen and timbered sides, with the bottom of the sides being earthen and the upper portion of the sides being timber. Little is known about the roof, except for some possible roof supports, and some charred remains of timbers. Inside, the floor was probably covered with wood and/or rubberized cloth. Finally, the built-in fireplace would have provided heat and cooking facilities.

CHAPTER 4

THE NON-ORGANIC ARTIFACT ASSEMBLAGE

by
Richard A. Fox

Introduction

Two types of artifactual evidence support the identification of Locality 6 as a portion of the site of Fort Ellsworth. These are certain U.S. military artifacts, and site dating using temporally sensitive artifacts, which are tabularized in Tables 4.1 and 4.2. But the term Locality 6 is rarely used in this chapter. Rather, for convenience the terms "Fort Ellsworth," or "the Fort Ellsworth site" are used when referring to the locality.

The artifact assemblage treated here consists of historic and aboriginal components. The artifacts are overwhelmingly historical in nature. This chapter focuses on them. Descriptions of prehistoric flakes, tools, and ceramic sherds are summarized in Appendix B.

Following brief comments on analytical procedures, this study continues with 1) the results of historical artifact analysis. Results provide an analytical foundation for 2) site dating, 3) for commenting on some activities of everyday life at Fort Ellsworth, and 4) for speculating on how well the U.S. Army supplied the frontier post. These four sections follow the scope-of-work (Ziegler 1997b), and research design (Fox 1997).

Procedures

The first step in analyzing the historical assemblage was artifact description. Descriptive results were recorded on specially prepared Fort Ellsworth Artifact Record (FEAR) forms. These forms were designed to record descriptive and analytical data. Analytical data are either recorded in detail on the form, or the historical references which contain the data are recorded. The form includes a classification system.

Classification

Classification began at the more inclusive level (material class) and proceeded toward refinement (category, type, variety, size). Since this analysis did not include organic materials, most specimens fell into metal, glass, ceramic, rock, and "other" classes.

Artifact categories used are meant to convey the broad contextual aspect in which specimens were most likely used. Categories are consistent with typical historical archaeology classification schemes. At frontier military posts, those categories which usually apply include construction, hardware, military, personal items, apparel, office, household, hospital, kitchen,

ceramics, food remains, fuel, and containers. Not all of these categories turned up in the Fort Ellsworth assemblage.

Category assignments can be somewhat arbitrary, and there is not always agreement in this regard. Nails, for example, can be classed as construction or hardware items. Despite ambiguities, categories serve to organize and simplify classification and description. Diversity in type and variety groupings throughout frontier post artifact assemblages varies widely. It is thus not possible to anticipate all classificatory combinations.

Quantification and Measurement

Descriptive data categories are listed on the FEAR form. They include, among other entries, a) catalog number, b) provenance, c) matrix type, d) quantification, and e) measurements. Items a) through c) are self-explanatory. Quantification included weight and/or count tallies. Generally, specimens of a highly fragmentary nature, such as brick/mortar, coal, charcoal, wood, sandstone, deteriorated iron, and plaster fragments, were not counted. These bulk specimens were weighed in the aggregate by catalog number - a mass analysis procedure - using the metric system (usually in kilograms/grams). Specimens contained in bulk were generally not measured individually.

The English measure system was used for measuring most artifacts. Typically they were designed and manufactured using English measures, and they were described in that measurement system (e.g., bullet weight in grains; a one-inch door hinge, etc.). Only key measurements necessary to adequately describe a specimen were taken.

Functional, Temporal and Manufacturer Analysis

In historical artifact assemblages, a few artifact types (e.g., clinker) are byproducts of activities. For these, function is not a meaningful objective (except to note the activity). For others, such as highly fragmented specimens (e.g., amorphous iron fragments), functions usually cannot be determined. Generally these specimen types were only described by class. Nonetheless, the functions of most artifacts could be described simply on the basis of formal attributes, sizing, and typing.

Manufacturers and dates of manufacture were determined from historical sources. A great variety of sources were used. A few artifact dates were established by determining when certain material types (e.g., celluloid, hard rubber, aluminum) were invented, introduced and/or discontinued. Many of the "bottle books" available were used to identify embossing attributes by manufacturer, contents, and dates of manufacture.

Technological attributes - e.g., closure and sealing technology - of metal containers (i.e., cans) provide good temporal data, particularly *terminus post quem* dates. Even nail technology provides rough temporal data. Such techniques were used in dating a number of types, including ammunition components on the basis of headstamping, technological attributes, caliber and style.

These sources were also useful in identifying manufacturers and use contexts (e.g., civilian, military).

The mail-order catalog business was in its infancy at the time Fort Ellsworth was occupied. Consequently, such sources were only marginally effective in analyzing non-military artifacts from the Civil War period. The 1865 Russell and Erwin catalog is an exception. But archaeological sources on other sites - civilian and military - provided good comparative data, especially for analyzing table and flatwares, civilian accouterments, personal items, and utilities. For military artifacts, numerous books on Civil War era military material culture, including arms, ordnance, dress, insignia, equipment, accouterments, and paraphernalia were consulted.

Summary

In sum, artifacts were identified and described where possible or appropriate on the basis of raw material, state of completeness, aberrations, size or weight, number of specimens, and color. Analysis included, where possible, determinations of artifact function, artifact usage, the manufacturer(s), and date(s) of use and/or manufacture of the artifact.

Artifact Analyses Results

Results of analyses are presented here using 13 broad categories arranged in the following order - Construction, Hardware, Military Equipage and Accouterments, Ammunition and Related Items, Apparel and Accouterments, Personal Items, Ceramics, Containers: Tin Cans, Containers: Glass, Other Glass, Other Metal, Unidentified Non-Metallic Item, and Bone. Artifacts described below are quantified by major provenances in Appendix D.

Construction Materials

Construction items, represented by durable materials such as brick and glass, are limited in variety and number. Most striking is evidence for burning or intense heat. Some window glass sherds are melted, mortar fragments are blackened, and sheet metal is heat-altered. Otherwise, this part of the assemblage is non-descript, except to say that it seems to represent very basic, hardly elaborate construction activities.

Brick

Most of the 106 brick specimens are fragments. None exhibits embossing or frogs. They are, by and large, poorly made. Only 10 are complete or substantially intact, and each of these is a soft-mud, common brick with a single struck face (cf. Guerke 1987:104-110). The seven complete specimens exhibit various dimensions. They measure, in inches, 8 1/2 (long) by 4 1/8 (wide) by 2 (thick), 8 1/4 by 4 1/8 by 2, 8 1/4 by 4 1/8 by 2 1/4, 8 1/4 by 4 1/8 by 2 1/8, 8 1/2 by 4 by 2, 7 1/2 by 4 by 2, and 7 1/2 by 4 by 1 3/4. All complete bricks have mortar adhering. Dimensions available on the three broken bricks are as follows. Widths are 4 and 4 3/8 inches; thickness are 2 1/8 and 2 3/8 inches.

Some brick fragments have mortar adhering, and a few are blackened from use in heating environments. Several are blackened or reddened and vitrified, or nearly so, evidently from intense heat during use. Most of the fragments, however, are unaltered except through breakage.

Mortar

Not counting mortar adhering to bricks, to fieldstone, to nails, and to sheet metal, pieces of lime mortar in the inventory weigh in total 6.3744 kilograms. Mortar is of various quality, mostly well-made, while a few fragments are overly sandy (and may simply be sandy conglomerates).

Several mortar fragments, some of which are blackened from fire, exhibit brick impressions. Other fragments without impressions are also blackened. Several fragments have soil adhering. Melted light green glass, probably from a window pane, is fused to one piece of mortar. Conversely, small mortar fragments are fused to larger window glass sherds (see Window Glass). This indicates that at least one window (probably several since mortar fused to glass comes from several provenances) was either set directly in mortar, or in a sash heavily mortared to hold it in the window opening.

Lime

Lime likely used for mortar mix occurs in small clumps. These in total weigh 369.4 grams. Most of these fragments are, as expected, soft and friable; a few are harder, and may be naturally occurring limestone.

Fieldstone

Fieldstone was clearly used for construction purposes, as several of the nearly 50 specimens have mortar adhering. Most appear to be sandstone or limestone. In total, fieldstone weighs 3.725 kilograms, the bulk of the weight made up by a single stone (2.761 kilograms). This large specimen (without mortar) exhibits four clearly visible parallel grooves, each about 2.5 inches long, running along one face. Two other grooves on the same face are indistinct. How these grooves came about is unknown, but they are not likely natural.

Window Glass

Some 366 glass sherds can confidently be attributed to window glass (they are flat and aqua in color), several of which are from window pane corners. A few sherds have been deformed by heat, others have mortar adhering, and some exhibit both heat-warping and mortar. Two sherds warped from heat are now fused to iron oxide and mortar.

Jones and Sullivan (1989:172) recommend, for various reasons, against using window pane thickness as a dating aid. Thickness variation within a site, however, is useful as a rough

temporal indicator. During the 19th century, technological factors limited standardization of window glass thickness, usually resulting in a wide range of thicknesses.

High variability in thickness is reflected in a measurement sample taken on Fort Ellsworth window glass sherds (one measurement per bag). Forty measurements produced a quite wide thickness range of between .0485 inch on the thinnest, and .101 inch on the thickest. Median thickness is .0700 to .0705 inch, while mean thickness is .073 inch. Twenty-eight of the 40 measurements fell between .0605 and .0780 inch. While the sample is small (11%), and unsystematic, the wide thickness range obtained, and variation from the mean and median, suggest window glass from the 19th century.

Sheet Metal

Virtually all sheet metal is highly fragmented, and most is ferrous. The only intact specimen, intentionally shaped, is in the form of a trapezoid cut from 1/16 inch sheet iron. Lengths of the parallel sides are 6 3/8 inches and 13 1/2 inches. Both non-parallel sides are 8 3/4 inches long. Two holes have been punched in it. They are slightly nearer the short parallel, one directly above the other, but equidistant from the non-parallel sides. The holes are irregularly shaped and flared on the backside, indicating they were hand-punched, not machine-cut. The holes and their attributes suggest a handmade or repaired tool that once had an attachment, perhaps a handle.

There are three non-ferrous specimens. They are cuprous, small (each less than a gram), and thin (.014 and .023 inch). Most likely they are torn from cartridge or shotshell cases.

Amorphous ferrous sheet metal fragments total 168. Thicknesses (gauge) range from .0180 inch to .0525 inch; by far most fall into the .02 inch to .0299 inch range. Most sheet metal, especially that in the two-hundredths range, is likely from tinned cans, but they were not found with specimens with can attributes (e.g., seams, caps). Affiliation therefore cannot be certain (although several exhibit traces of tinning, and one has solder adhering). Also, 59 of the specimens may be from a pail. They are a deep rust color, and brittle, as if subjected to heat.

Several specimens are from sheet metal which served in construction capacities. These fragments, 26 in all, have mortar adhering. They probably came from flashing used in building construction. Of these, some are oxidized a deep red, and are brittle, as if subjected to intense heat. Also suggesting construction are a few fragments with holes, either "square" from cut nails, or round holes from screws or wire nails. One sheet metal fragment appears to be galvanized.

Sheet metal fragments from ferrous (probably iron) strap number 60. They are in various widths - 5/16", 7/16", 1/2", 9/16", 5/8", 11/16", 3/4", 13/16", 7/8", 1", 1 1/8" and 1 1/4". Most common widths are 5/8" and 3/4". Thicknesses (gauge) range from .0165 inch to .0660 inch, with most in the .3 to .399 inch and .5 to .599 inch ranges. Twenty-two of the 60 strap fragments exhibit fastener holes, either "square" from cut nails, or round from screws or wire nails. One

specimen is pierced by two 3d common cut nails, and another is pierced by a single 3d cut common.

Hardware

This section covers various kinds of hardware - architectural, transportation, furniture, household, maintenance, fastening, occupational, and unidentified objects. Architectural hardware is limited in variety and number, which is seemingly consistent with the few and non-descript construction types.

Trunk Furniture

Two items believed to be from trunks are shown in Plate 1. One is a ferrous strap adorned with a pressed iron ornamental end, shown in close-up in Plate 2 and Figure 4.1a. The end is clipped on as shown in Plate 3. The partial strap, in two pieces, is 3/4 of an inch wide (thickness is .047 inch). The pieces are about 6 3/4 inches and 13 inches long. Straps of this nature are often found on trunk lids and bodies.

A largely intact stamped sheet brass escutcheon - a lockplate - is probably from a trunk. The undecorated specimen is shown in Figure 4.1b and Plate 1. Crouch (1995:43) illustrates what is probably an identical trunk lockplate found at a Civil War site attributed to an Alabama infantry unit.

Lockset Part

What may be a catch for a door lockset is shown in Plate 4 (bottom middle). Total length of the ferrous specimen is 1 1/8 inches, half of which taken up by the pin. Maximum width is 9/16 inch. The specimen shows no use wear.

Animal Traps

Two mass-produced traps were unearthed from the Fort Ellsworth site (Plate 5). Both are single spring (long), leg-hold steel traps (cf. Figure 12-4 in Gillsvik 1980:156). One specimen (the larger) is complete; it appears only the pan is missing from the smaller trap. Mass-production of the steel trap began in the 1850s, setting the basic patterns still in use today (Gerstell 1985:168).

Neither trap exhibits manufacturer's marks; if once present, rust has obliterated them. Nonetheless, both probably date to the 20th century. The smaller specimen exhibits a humped cross (which eliminated the pan post), a feature patented in 1907 (Gerstell 1985:196), suggesting this trap dates after that year.

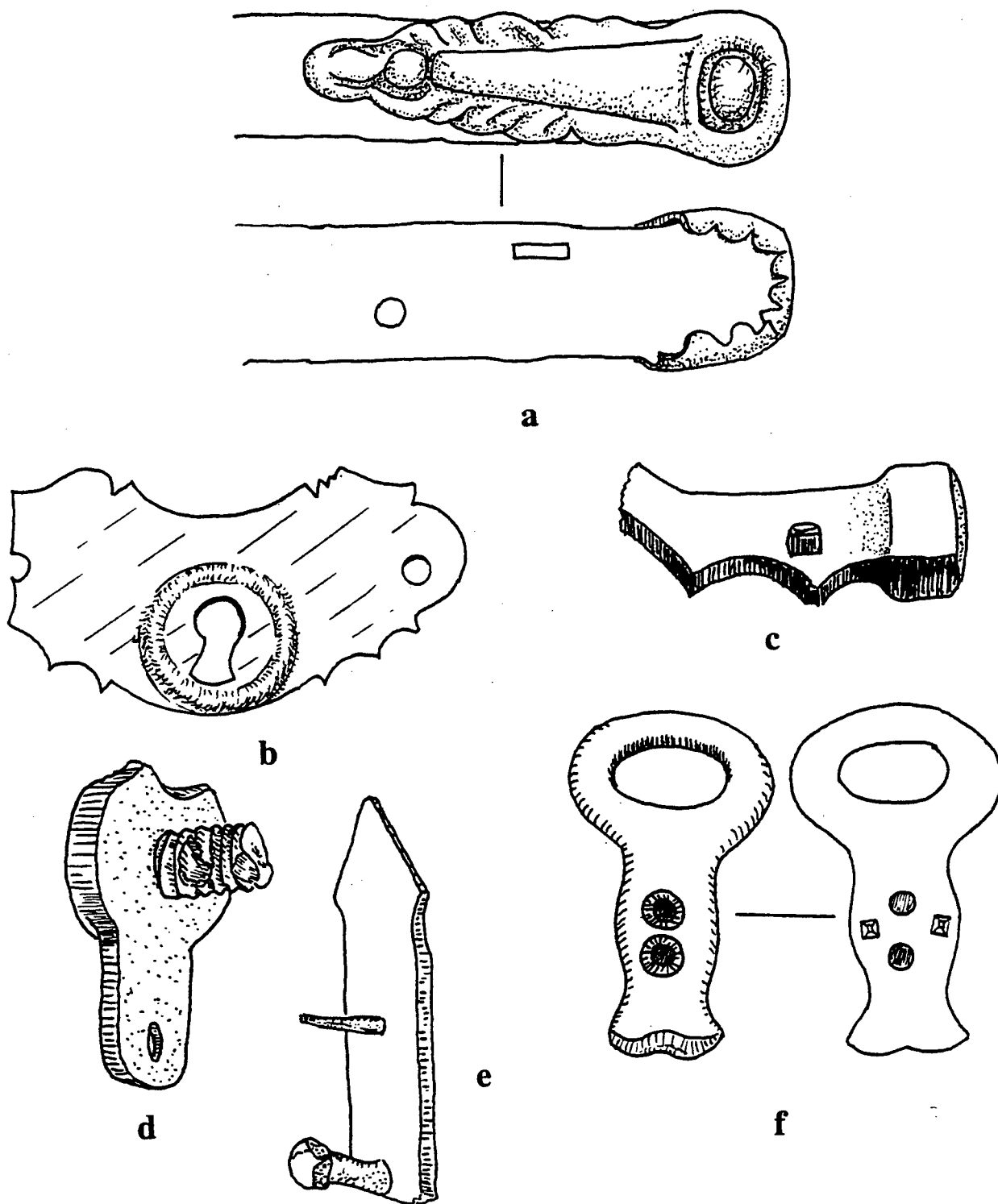


Figure 4.1. a) ornamental trunk strap (?), ferrous; b) trunk lockplate, brass; c) unknown hardware, ferrous (lockset part?); d-f) unknown hardware, ferrous. Actual sizes. Ft. Ellsworth (14EW26), Locality 6.

The larger trap is nearly identical to a copy (branded "Victoria") of Peck, Stow and Wilcox's "Hector" model (cf. Gerstell 1985:219, Fig. 179). The Hector was introduced early in 1904 (Gerstell 1985:218). The Fort Ellsworth trap exhibits at least four of five new features incorporated in the Hector - a) jaws turned in pivot holes on upturned ends of base; b) bulge on right jaw; c) riveted plain pan post; and d) riveted sheet metal pan. Three of these features were patented in 1902 (Gerstell 1985:219); two of the patented features (a and b above) are on the Fort Ellsworth trap.

Technological features, some patented, suggest that the traps date no earlier than between 1902 and 1907. Conditions of these specimens (they likely could be reused with a good cleaning and a little repair) suggest later dates for both, probably much later.

Traps sizes are mostly unstandardized, but generally these two (jaw widths estimated at three and 3 1/2 inches) might be referred to as sizes #0 and #1, suitable for taking, for example, weasel and muskrat, respectively (cf. Gerstell 1985:38).

Fasteners

Fastener types are varied. Most prolific are cut common nails and spikes. The four wire nails described below are most likely intrusive. The inventory contains the usual staples, tacks, brads, screws, nuts, bolts and washers. Also quantified and described are spacers, horseshoe nails, rivets and burs.

NAILS

The nail inventory (n=2214), consisting nearly exclusively of cut nails, overwhelmingly indicates a pre-1877 historic occupation of the Fort Ellsworth site. That was the year (1877) that the first American patent for wire nail machines was issued (Edwards and Wells 1993:18). Wire nail machines had been invented around 1820 (in France) (Edwards and Wells 1993:17), and wire brads were made in New York by 1851 (Noel Hume 1972:254). But not until 1887 did wire nails become economically feasible (when the price of Bessemer steel dropped) (Edwards and Wells 1993:18). Thus the few wire nails (n=4) reported below are probably from a time later - likely part of the region's post-1887 general agricultural scatter - than the cut nails found at the Fort Ellsworth site.

Wire Nails

There are only four wire nails in the inventory, all complete. Sizes are 3d (n=1), 16d (n=2) and 40d (n=1). Metal detector surveys located these specimens, all near the surface.

Cut Common Nails and Nail Fragments

Complete cut common nails in sizes 2d through 60d, plus shank and head/shank fragments, number 2112 (exclusive of the handful of cut nails that pierce sheet metal). This total increases slightly when the five 5" cut spikes, the seven 6" cut spikes, and the single head from a

cut nail are added. More than any other cut type, cut commons suggest the nail assemblage dates to a pre-1877 time period.

The cut common nail and spike distribution by size follows. The distribution is in part based on estimated sizes, since lax 19th century production standards often resulted in nails between sizes. The head from a cut nail and the cut shanks are reported here, but some of them could be from nail types and varieties other than common (such as shoe nails). The cut head/shanks reported here appear to be from common nails.

2d - 5	6d - 136	20d - 16	50d - 5
3d - 70	8d - 252	30d - 18	60d - 5
4d - 141	10d - 162	40d - 4	5" spike - 2
5d - 68	12d - 94		6" spike - 7

shanks - 535 head - 1 head/shanks - 606

Sizes 4d through 12d are most common. This, plus the relative paucity of spikes and larger nails, and particularly the few nails in the 20d size, suggests that substantial frame buildings were not part of the Fort Ellsworth built landscape.

Three of the cut common nail specimens listed above have been modified by beveling the ends, either while intact or after breakage. These are (estimated) a 40d nail, a 60d nail and a 6" spike. Perhaps they were used as pegs. Two other specimens in the distribution have irregular heads; one has a round head, and the head on another is grossly large. Several of the shanks have mortar adhering; they are badly rusted and exfoliated.

Cut Finishing Nails

Cut finishing nails total 82. This number is comparatively low, but considering the absence of wire finishing nails, cut finishing nails reinforce the dating suggested by cut commons, that is, a pre-1877 temporal provenance.

Cut finishing nails fall into the 4d to 12d size range, and also are represented in 3/4" (n=2), 1" (n=5), 1 1/4" (n=1), and 1 1/2" (n=3) sizes. Size 6d is the most common (n=34), followed by 8d (n=18). Numbers for other sizes are: 4d (n=1), 5d (n=1), 10d (n=8) and 12d (n=4). The inventory also contains broken finishing nails, including head/shanks (n=3) and shanks (n=2).

Box Nail

One specimen is believed to be a box nail in the 10d size. It too is a cut nail.

Clinch Nails

The seven clinch nails are size 6d (estimated). All are cut nails, and each has been clinched.

STAPLES

The several varieties of staples (n=8) are fence (U-shaped), square, C-shaped, and rectangular. All are ferrous. The single square specimen is a 1" staple - estimated, since half of it is missing. The C-shaped specimen is a heavy-duty staple made of 1/4 inch round stock.

The three fence staples are in 1" (n=1) and 1 1/4" (n=2) sizes. Two rectangular staples are made of flat stock, .0765 inch and .115 inch. Respective sizes are 1 1/4 inches and about 1 1/2 inches.

The final specimen is fragmented. Also made of flat stock, it is from the staple body (not shanks). Its size suggests it is from a tie-down staple, perhaps of the kind used on wagons.

TACKS AND BRADS

Cut tacks (ferrous) in two varieties total 21. All but one (n=20) are square-headed carpet tacks. The remaining specimen is also a carpet tack, but is round-headed. Standard sizes are 1/2", 9/16", 5/8", 3/4" and 7/8".

One ferrous wire brad is also present - in the 1" standard size. A badly deformed, non-ferrous specimen may be either a tack or nail fragment. The head and small portion of the shank remain, and appear to be cut. The specimen is highly polished, as if waterworn, and very light, suggesting aluminum.

Another specimen is a fancy brass tack with pointed end and threaded shaft. The half-inch diameter flat head is decorated with stemmed laurel leaves placed contiguously around the head. Stems emanate from the head's center and develop into leaves about halfway to the rim. This specimen is 9/16 inch long.

SCREWS

Specimens (n=19) from the Fort Ellsworth assemblage are all flat head, slotted wood screws. Ranging from 3/4 of an inch to three inches long, they are represented in various sizes #5 (n=1), #7 (n=2), #8 (n=13), #9 (n=2), and #20 (n=1). Due to breakage, several are estimated sizes.

BOLTS, NUTS, WASHERS AND SPACERS

The seven ferrous bolts include three machine bolts. One is a 3/8 inch diameter bolt with hexagonal head. The specimen is 1 1/8 inches long. The end of the bolt exhibits a short nipple. The lower half of the shaft is threaded (fine). Two other specimens are similarly threaded,

except they exhibit coarse threads. Both are 5/8" bolts; one is three inches long, and the other 3 1/4 inches in length. A ferrous square nut is in place on the longer specimen.

The remaining specimens are lag or carriage bolts. One square-head specimen is an 11/16 inch bolt that is 7 3/8 inches long. The lower 1 1/2 inches are coarse-threaded. Another is a 3/8 inch bolt; the threaded portion of the shaft is missing. This bolt exhibits a truncated conical head and a square lock immediately below it. A fragmented dome-head bolt also lacks the threaded portion. This specimen is a 5/16 inch bolt. The smallest bolt is dome-headed and 3/16 inch in diameter. It too lacks the threaded portion. A 3/16 inch flat washer (ferrous) is rusted in place.

In addition to this washer, there are two others, both flat washers (ferrous). A fractured specimen was a 1/2 inch washer. Another, a heavy duty washer, fit a 1 1/4 bolt. This specimen is slightly cupped, either for locking purposes, or indicating it has been used. One of the two nuts is on a machine bolt, as described above. The other is also a square nut, but in the 1/4 inch size.

The three unthreaded spacers are ferrous. Perhaps they doubled as washers, but they were meant for heavy-duty use. The obverse of one, a roughly rectangular spacer (1 3/16 by 1 9/16 inches), exhibits beveled edges, and a countersunk hole on the reverse. It is made of 1/3 inch flat stock. A circular spacer is made of 1/4 inch flat stock. Outside diameter is two inches; it fit an 11/16 inch rod or bolt. Another circular, but slightly cupped spacer, is made of 3/16 inch flat stock. Outside diameter is 2 1/2 inches; it fit a 1 1/4 inch diameter bolt or rod.

HORSESHOE NAILS

All of the 25 loose horseshoe nails (unattached to shoes) are ferrous. Most are fragments (n=14) which cannot be reliably sized. Complete specimens are #8 (n=3), #9 (n=2) and #10 (n=6) horseshoe nails. The #10 size is the largest available.

RIVETS AND BURS

All rivets (n=29), some with and some without burs, are of copper. They are represented in various sizes (head diameter), some used and some unused. Most common are 7/16 inch diameter rivets of varying lengths (n=12). Next are those at 3/8 inch diameter (n=6), followed by rivets in 9/16 inch diameter (n=4). There are three 13/32 diameter specimens, two at 9/32, and one each at 5/16 inch and 1/2 inch. Lengths range from 3/16 inch to 3/4 inch.

Animal Shoes

There are five complete mule or horseshoes in the assemblage, and two pieces, both of which are probably from the same shoe. All are ferrous. Each is a different size and shape, and none appears to be of a standard size, indicating the shoes were hand-forged to fit the hoof. Most shoes exhibit one bent horseshoe nail, or more, and/or a nail head or heads.

The largest shoe, complete but well-worn, is five inches long, and 3 3/4 inches wide. It exhibits toe caulks. Two complete specimens are 4 3/4 inches long; one is four inches wide, the other 3 1/2 inches in width. Both specimens exhibit toe caulks. The nailing troughs on the narrower shoe are worn to the point they are hardly visible.

Two shoes are 4 1/2 inches long. A toe caulk on one (3 1/2 inches wide) is worn off (the other caulk is not so worn), and the heel is well-worn. The other (3 5/8 inches wide) lacks toe caulks, but does have a heel caulk. The nailing troughs on this well-worn specimen are virtually gone. Finally, two pieces are from opposite sides of a shoe, and are probably from the same shoe (although they do not refit). Both are 4 3/4 inches long, and both pieces have a toe caulk.

Wagon Hardware

Two wagon hardware items are complete mass-produced (ferrous) wagon bow staples of the to-drive type. These staples secured the bows which supported canvas above the wagon.

Both specimens were probably galvanized. One, made of .21 inch flat stock, is four inches long with a spread of 3 3/8 inches. Width is 1 1/4 inches. The shanks on this staple are double-flared. A smaller specimen, made of 1/3 inch flat stock, is three inches long, with a 1 1/2 inch spread. Width of the single-flared shank is 1/2 inch. This specimen (single-flare) is illustrated in the 1895 Montgomery Ward catalog in 1 1/2, 1 3/4 and two inch sizes (see Emmet 1969:597). Another wagon bow staple (or tie down) is represented by a fragment from the tapered end of a shank.

A ferrous wagon box stay is made of 1/4 inch flat stock. The mass-produced, rectangular stay is 7 1/4 inches long and 1 1/2 inches wide. Two 5/16 inch rivet holes are located near each end. Herskovitz (1978:89, 90) describes a similar but shorter strap (4 3/4 inches) - found at Fort Bowie, AZ (1862-1894) - as an "axle clip". Miller *et al.* (1997:29, 32), reporting on excavations at the Wagon Box battlefield (1867), depict and describe such stays as reinforcement straps for wagon side rails.

A long rivet, probably hand-forged, may have been used with a wagon box stay. The rivet would have fit through the stay holes. Made of about 1/4 inch round stock, the specimen is four inches long. Both ends have been flattened by forging.

Another ferrous specimen is a collar made of .188 inch flat stock. The specimen, also mass-produce, is large, weighing 317.5 grams; it is about an inch wide, two inches high, and 5 3/4 inches long. One of the two long sides is slightly bowed outward. This is a collar that may have fit a wagon tongue (to hinder splitting), although no analog has yet been found.

Buckles, Slides and Rings

The eight non-apparel buckles are of types and sizes that are typically seen on tack gear, especially straps for such things as halters, bridles and rigging (see Apparel and Accouterments

section, Buckles for others). Japanned iron buckles were also used on Civil War equipage, such as knapsacks. The regulation U.S. double-bag knapsack (ca. 1853-1872), for example, utilized shoulder straps about two inches wide (McChristian 1995:36).

Five of the eight, all ferrous, are roller buckles. One complete specimen measures 2 3/8 inches by 1 1/2 inches. Next in size, and also complete, is a 1 5/8 inch by 1 3/16 inch roller buckle. The tongue on a one inch roller buckle is missing. Another specimen, one inch by 3/4 inch, is complete. The smallest specimen, this too a complete buckle, measures 7/8 inch by 3/4 inch. These buckles received straps of approximately two inches, 1 1/2 inches, 7/8 inch, 3/4 inch, and 5/8 inch widths (maximum), respectively.

Two other ferrous specimens, both complete, are rectangular center-bar buckles. The larger measures an inch by 1 3/4 inches, while dimensions of the other are an inch by 1 1/2 inches. Both accepted straps of up to about 7/8 inch in width. The final specimen is a badly rusted but complete D-buckle. It measures an inch by 7/8 inch, and probably was meant for a 3/4 inch wide strap.

Two ferrous specimens may be rectangular "rings", or slides, or they could be buckles absent rollers, if once present, and tongues. One, made of 1/4 inch round stock, is 2 1/4 inches by one inch. The other, of 1/5 inch round stock, measures 1 1/4 inches by 7/8 inch. These accepted straps of 1 3/4 inch and 7/8 inch widths (maximum).

There are two D-rings in the assemblage. One is a brass sabre hook D-ring discussed in the Military Equipage and Accouterments section (Sabre Hook and D-Ring). The other is a ferrous ring that accepted a strap up to 1 3/4 inches wide.

The eight ferrous O-rings vary in size (outside diameter). These are 1 1/4 inch (n=1), 1 1/2 inch (n=1), 1 5/8 inch (n=4), 1 3/4 inch (n=1), and two inch (n=1). Size of the smallest ring is estimated; much of it has rusted away. All rings are made of round stock varying from .10 to .29 inch in diameter.

A staple remains attached to one of the 1 5/8 inch O-rings. Miller *et al.* (1997:40) found a similar item at the Wagon Box battlefield (1867); he suggests it was from a McClellan saddle. Herskovitz (1978:84, 85) describes these specimens in brass, and identifies them as McClellan saddle skirt rings and staples. Such saddles typically used brass skirt rings, so while the Fort Ellsworth specimen may not be from a McClellan, another saddle type is reasonable. Finally, O-rings with staples were offered for sale by Russell and Erwin (1980:146) Hardware as "wrought trap door rings and staples". Otherwise, O-rings (without staples) are typically found on tack gear, military and civilian.

Wire

Wire fragments are not plentiful, and barbed wire is not present. None of the six specimens exceeds 6 1/2 inches in length, and the shortest is about two inches long. Wire diameters range from .0285 inch to .098 inch.

The absence of barbed wire is suggestive. Even though barbed wire (two-strand barbed) was not invented and patented until 1873 and 1874 (McCallum and McCallum 1965:34ff), it can be, as a result of the general agricultural scatter, intrusive at sites of earlier age. But this does not seem to be the case at Fort Ellsworth (at least judging from the area excavated), suggesting the site pre-dates 1873. (Earlier patents were granted in 1867, 1868 and 1871, but these were not two-strand barb patents; see Clifton 1970:365).

Stove Plate

Stove plate is made from cast iron. There are two specimens, one probably a door, and the other likely a lid from a stove, either heating or cooking. The rectangular door measures 7 1/2 inches by 4 3/4 inches. The reverse is slightly recessed, and the front is slightly raised, creating a narrow border around the plate edges. The door was probably hinged at two corners where the border extended slightly beyond the edge, but these extensions are broken off. There appears to be a short line of unintelligible embossing on the reverse (the plate is badly oxidized).

Two pieces refit to form about half a stove lid, which was originally circular (ca. 8 1/2 inches in diameter). The lid's perimeter features two closely spaced raised ridges which form a trough in-between. The lid's center area is set off by a small-diameter circle, also defined by a raised ridge. A short raised line, with a dot directly below it, is located between the inner and outer ridges. Otherwise, the lid does not exhibit embossing.

Grate

Made of 3/16 inch iron flat stock, the nearly square grate is 10 5/8 inches long by 9 1/16 inches wide. The six parallel grate bars (two of which double as the long sides) run with the length. The near 3/4 inch width of each bar (one of which is missing) results in five 15/16 inch gaps. All edges on the upside, including those of the grate bars, are slightly beveled.

Hinges and Pintel

Four ferrous specimens are parts of fractured rectangular butt hinges (Plate 22). On three, much of the hinge plate plus a pin sleeve remain (pins are absent). Each of these is an inch wide, but original lengths are unavailable because they are broken (as is, one is 1 3/8 inches long; the other two are 1 1/2 inches in length). A cut nail adheres to a screw hole in each of two hinges. Nails are not present in the other, but two screw holes are (the hinge fractured along the axis of the lower hole). The three specimens are made from .17 and .20 inch flat stock. The fourth specimen is a partial pin sleeve with a tiny portion of the plate.

Pintels also served as hinges. In using a pintel, the tapered end, or shank, was driven into wood, perhaps a beam. Hinge sleeves on gate or door hinges could then be fit over the pintel pin, which projected upward at a right angle from the shank. The Fort Ellsworth pintel (ferrous) is 4 3/4 inches long. The shank is roughly square, but tapered, and the pin is round.

Total height is 2 3/8 inches. Carlson (1979:249) found similar pintels at Fort Atkinson, NE (1820-1827), and they are used today.

Chain Repair Link

The 1865 Russell and Erwin (1980:146) hardware catalog describes a chain repair link as a "wrought iron open or lap link for mending chains". One such specimen was found at Fort Ellsworth - in the closed position. Made of 1/3 inch ferrous round stock, it is 2 9/16 inches long.

Spring

This complete specimen can best be described as a "screen door" spring, although no such item is listed in Russell and Erwin's 1865 hardware catalog. Rather springs of this kind in the catalog are called "spiral springs", which are listed and illustrated as house bell accessories (Russell and Erwin 1980:75, 76). Total length of the Fort Ellsworth specimen (ferrous) is seven inches (relaxed position), which would be a No. 5 spiral made of No. 18 wire in the Russell and Erwin (1980:76) catalog. Whether or not the specimen dates to the 19th century is an open question, since modern door springs are virtually identical.

Tubing

Two fragments of tubing are made of brass. Together they weigh 30.8 grams (with dirt inside). One is around five inches long, the other about three inches. Outside diameters of both are 1/4 inch. Both specimens exhibit reeding that spirals along the tubes. Whether this is decoration or machine feed-marks is uncertain.

Nine other tubing fragments are ferrous, and badly oxidized. Seven of these are tiny fragments. The two largest are 1/2 and 3/4 inch in length. Those that can be measured exhibit a 1/4 inch diameter hole. Together the specimens weigh 4.1 grams. Functions of the tubing are unknown.

Hooks

A military hook is described in the Military Equipage and Accouterments section (Sabre Hook and D-Ring). The hardware hook described here is a ferrous, drive-in meat hook. The tapered shank (roughly rectangular) is 1 5/8 inches long, and it continues in round stock to form the hook end. The tapered end was driven into a beam or stud, leaving the hook exposed.

Carlson (1979:249), reporting on Fort Atkinson, NE (1820-1827), material culture, calls this type a "wall hook". The 1865 Russell and Erwin (1980:145) hardware catalog calls it an "iron meat hook, to drive", or "tinned meat hook, to drive". The catalog lists several sizes, including a No. 3, presumably a three-inch hook. Hooks of this kind are used today.

Lamp Glass

Lamp glass sherds represent lighting devices, namely oil lamps, at the site. The curved sherds (n=66) are mostly in clear glass, and clear with light-yellow tint, but a few others are clear with light-green tint, and aqua. One clear with light-yellow tint rim sherd is from a globular lamp chimney. Two aqua rimsherds are from an S-shaped chimney. Otherwise, the specimens are body sherds, one of which is heat-damaged. Another exhibits evidence for a molded ridge. Eight (of the 66) clear sherds are thin like lamp glass, but only slightly curved, and they could be from clock-face glass.

Lamp glass likely does not represent Army-issue lighting devices. Kerosene lamps were not issued by the Quartermaster Department until about 1880 (Herskovitz 1978:72).

Hoop

The complete hoop is fractured in one place, but the ends refit. Made of 11/16 inch wide iron strap, the two ends are lapped and fastened together with two ferrous rivets. Strap thickness is .0565 inch. The hoop is 11 1/2 inches in diameter. Possibly this is a barrel hoop.

Pail

Some 34 sheet metal fragments represent a nearly disintegrated pail. Two pieces exhibit remnants of bail ears. Remnants of bail loops are attached to what is left of the ears. When functional, the two bail loops fit through the ears in such a way that they pivoted up and down through 180 degrees. The bail, no trace of which survives, attached to the bail loops. Some of the fragments show that the pail had a folded rim. Not enough is left of this container to estimate its size or shape.

Round Stock: Modified Iron Rod

The largest modified iron rod (269.6 grams) is a "spindle" hand-forged from 3/4 inch round stock. Shaft diameter tapers from 3/4 inch to 5/8 inch. Total length is now 5 1/4 inches, but the larger end is fractured. The narrower end has been forged into a flat disk about 1 1/4 inches in diameter. A conical mound of iron has been applied (welded) to the top of the disk. Function of this specimen is unknown.

Four relatively straight rods of 1/3 inch round stock exhibit modification. On all four, one end is fractured, and the other end is beveled (see Plate 8, top right). The specimens vary in length from about three inches to 4 3/8 inches. Military tent pegs of the 1860s were made of flat stock (cf. Miller *et al.* 1997:38, 39), so they are not likely military-issue, but they could be remnants of hand-forged pegs.

Another beveled-end rod is made of smaller round stock (.216 inch). It too is fractured at the opposite end. This could be a wire spike shank that has been modified. A short rod of nearly

the same size round stock (.22 inch) is similar. It is fractured at one end, but opposite that is a split, splayed end undoubtedly created by hand-forging. This specimen is 2 1/4 inches long.

Three other specimens are clearly hand-forged. One is forged to resemble an eyed rod. One end is looped back to the shaft to form the eye. The straight shaft tapers to a dull point. The 4 1/4 inch long specimen is made of .42 inch round stock. A second specimen could be a hand-forged gate hook. It also has a forged eye, but the shaft is not entirely straight; it eventually turns to form a hook. The specimen, made of quarter inch round stock, is 4 1/8 inches long.

The third hand-forged rod - made of about 1/3 inch round stock - is roughly shaped like the Greek letter, Omega. Length is about 2 1/2 inches; maximum width is around 1 1/4 inches. Cut marks, which appear to be randomly spaced, run along both sides of the item (as viewed when laying flat).

Round Stock: Unmodified Iron Rod

These specimens are unmodified pieces (n=8) from various sizes of iron round stock. Round stock sizes represented are 1/6 inch, 1/4 inch and 1/3 inch (approximately; because of rust, measurements vary around these sizes). The longest fragment is 9 1/4 inches long; the shortest is about an inch. Pinched or otherwise irregular ends on these rods suggest blacksmithing activities.

Flat Stock: Modified

One flat stock item (.185 inch stock) is a 13 inch-long piece of strap iron. At each end there are two mounting holes, each 5/16 inch in diameter. Both ends are fractured, leaving one incomplete hole at each end. This ferrous specimen is slightly tapered, from 1 1/4 inches to 1 1/16 inches.

Another flat stock piece (ferrous) is curvilinear in shape, as if broken from a flat, circular ring. A single mounting hole is located at each end where the breaks occurred (the breaks left partial holes). The specimen is now more or less 1 1/2 inches long; width is 3/8 inch. The piece is made of flat stock that is .096 inch thick.

Flat Stock: Unmodified

Non-descript flat stock is principally in bar or strap form, and was probably used as stock in blacksmithing operations. The fifteen pieces are in various sizes and shapes. Stock sizes include thicknesses of 1/8, 1/6, 5/16, 3/8, and 7/16 of an inch. Widths range from 1/2 inch to more than an inch. Lengths start at less than an inch and run to over seven inches. Most exhibit rough ends, indicating they have been trimmed from larger pieces of stock.

Unidentified Hardware

Several objects (other than those described in the Modified iron stock sections) have defied identification. Some of these, all ferrous, are shown in Figure 4.1c-f, and Plate 6. All seem complete, except the specimen (from a mortise lockset?) at upper-left, Plate 6 (Figure 4.1c), the narrower end of which is fractured. The lower-left specimen in Plate 6 (see also Figure 4.1d) has a 7/16 inch threaded shaft (not a bolt), which is flush on the other side. The smaller hole is countersunk. The projections on the Plate 6, lower-middle specimen (also Figure 4.1e) are a roundhead cut tack, and a wire or cut nail. Mounting holes in the upper-middle specimen of Plate 6 (also Figure 4.1f) are also countersunk. On the reverse (a flat surface) are two short, tapered square studs situated on the horizontal between the holes. The projection on the far-right artifact in Plate 6 (also Figure 4.2a) is a cut nail fragment.

Also enigmatic is a hand-forged bracket shown in Plate 7. A hand-forged staple of some sort penetrates the longer leg; a mounting hole is drilled through the shorter leg. Both legs are an inch wide. This object was made from a single piece of 1/4 inch flat stock by splitting the stock to form the 1/8 inch thick legs, but stopping short to leave a 1/4 inch thick shank which was subsequently tapered. The short leg and shank together total 6 3/4 inches in length, compared to the other leg which is 8 3/4 inches long.

Another puzzling object is a narrow, thin "strip" of ferrous material. The metal is springy, suggesting a steel flat spring. The specimen is 1 7/8 inches long, with a uniform width of 1/16 inch. It is only .037 inch thick.

Military Equipage and Accouterments

Equipage and accouterments described here - military-issue items - establish beyond any doubt a military presence at the site. Unlike ammunition and firearms, which tend to reach civilian markets, items such as sabre hooks, shoulder scale wing studs, insignia and others can be expected only when military personnel are present. Variety in this category also suggests that the military presence was not measured in weeks or months. Further, items described here offer good opportunities for temporal analyses, because of the military tendency to frequently update style and technological capabilities.

Firearm Tool

An appendage from Fort Ellsworth is a combination nipple wrench/screwdriver for a musket. The ferrous specimen is badly rusted, but wrench size appears to be about a quarter inch. The specimen is depicted in Plate 8 (bottom) and Figure 4.2b. An identical specimen - with Civil War provenance - is illustrated in Crouch (1995:97), who notes that combination tools

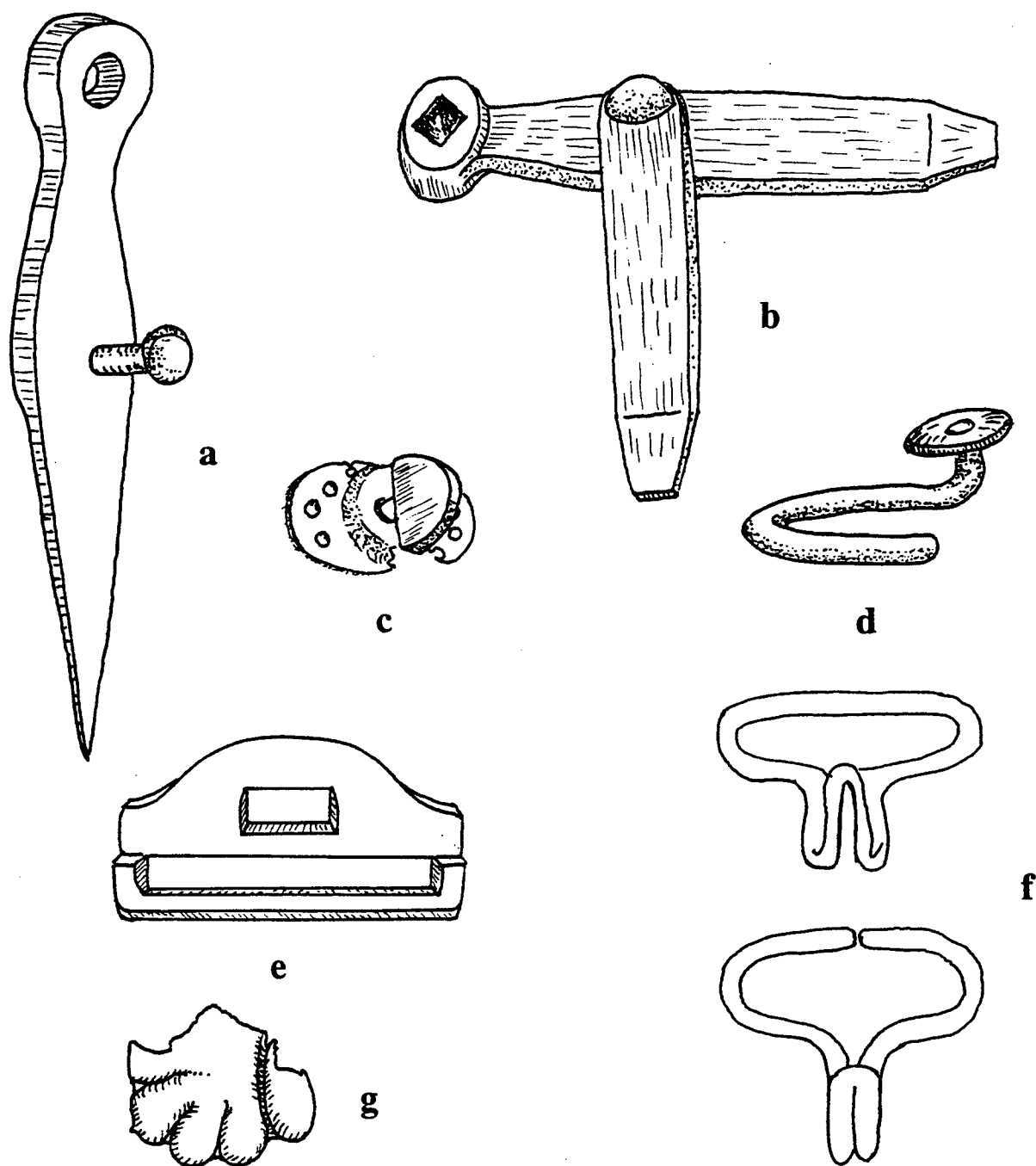


Figure 4.2. a) unknown hardware, ferrous; b) .58 caliber Springfield rifle appendage, ferrous; c) shoulder scale wing stud, brass; d) knapsack strap-adjustment hook, brass; e) belt catch, brass; f) strap hooks, brass; g) hat eagle (?) insignia fragment, stamped brass. Actual sizes. Ft. Ellsworth (14EW26), Locality 6.

like these were issued by the U.S. military beginning in 1841. Lord (1995:3) also depicts this appendage, noting that it was used with the .58 caliber Springfield rifled musket.

The first Springfield rifled musket in .58 caliber was the Model 1855 (Reilly 1970:75). These and model 1861, 1863 and 1864 Springfield rifled muskets were the principal arms used by Union soldiers during the Civil War (Lord 1995:180). Near the Civil War's end, the U.S. Army began converting Springfield rifled muskets to breechloading rifles, which eliminated a need for the nipple wrench. These included the Model 1866 and Model 1868 Springfields. The Army in 1870 adopted the Model 1870 Springfield, a true rifle (McChristian 1995:108-109). So, the Fort Ellsworth appendage use life - assuming it was not used in civilian context - probably dates between 1855 and around 1866.

Sabre Hook and D-Ring

The brass-wire sabre hook was a standard U.S. Army issue item from 1841 to 1873 (Herskovitz 1978:35-36). The hook could be attached to a brass D-ring, which fit on the sabre belt. Illustrations can be found in Lord (1955:269) and McChristian (1995:92).

Both hook and ring were found at Fort Ellsworth, although not together. Made of .173 inch diameter brass roundstock, maximum width of the D-ring is 1 9/16 inches. The wire gauge of the hook is nearly the same - .1715 inch diameter. The Army in 1874 adopted the 1874-pattern sabre belt, which took a sabre hook stamped from sheet brass. But full conversion to the 1874 belt was a long process (McChristian 1995:182, 199). Very likely some wire sabre hooks remained in service for some years after their official demise.

Canteens and Stoppers

The two partial canteens (ferrous) from Fort Ellsworth are U.S. Army canteens. One specimen consists of half the canteen body, but without the spout (Plate 23). Remnants of two strap guides remain (bottom guide and a side guide). Often called the "bullseye" pattern because of corrugations on both halves of the body, it is a Model 1858 U.S.-issue canteen (McChristian 1997a), perhaps an 1861 version. The other specimen, represented by six sheet metal fragments, is probably from the same model canteen. Corrugation is visible, and a few fragments exhibit folded edges where the two body halves joined. According to Herskovitz (1978:34, 35), the 1861 version canteen came in various modifications, and was used as late as 1898.

The two ferrous canteen stoppers could be from the 1861 pattern canteen, its antecedent, the 1858 pattern, the 1872 stopper modification, or the 1874 pattern canteen (see McChristian 1995:90, 91, 212). Corks and chains are missing from the specimens, but both retain the lid, washer and keeper at the threaded end of the shaft (see Plate 8, top left).

Shoulder Scale Wing Stud

During the latter half of the 19th century, officers and men in various U.S. military branches wore stamped brass shoulder scales from time to time, usually on dress occasions. One end of the scale was attached by means of a wing stud sewn to the coat shoulder near the collar. The stud fit through a slot in the scale, and was turned 90 degrees (Lord 1995:229).

Such a wing stud was found at Fort Ellsworth - used with the 1854 pattern metallic scale (McChristian 1997a). The stud is made of brass, and has a white metal keeper. The specimen is illustrated in Figure 4.2c and Plate 9 (bottom left). Figure 4.3 shows the position of the stud relative to the shoulder scale. Crouch (1995:174) illustrates scales, the wing stud, and the bar (not found at Fort Ellsworth) by which the scale end opposite the stud was secured. These specimens were found at Civil War sites.

Knapsack Strap-Adjustment Hook

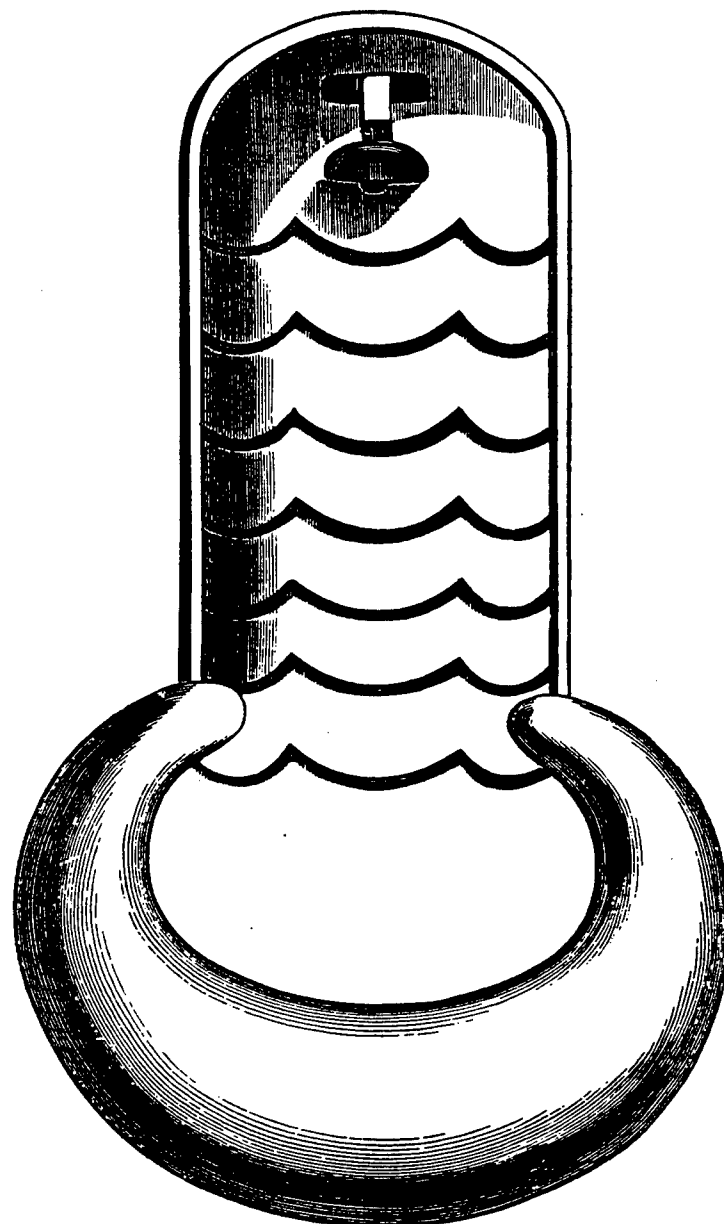
During the Civil War, brass hooks with domed heads were attached to straps on various Union knapsacks. These hooks allowed a soldier to adjust the knapsack for comfort. One of these was the Clark knapsack, patented in 1863, and named for the patentee, Augustus N. Clark of Boston (Lord 1995:148). Lord (1995:148) shows the Clark knapsack with the adjustment hooks. Another was the regulation U.S. double-bag knapsack. The hook and bag are illustrated in Todd (1974:207). This knapsack was adopted by the U.S. military around 1853, and replaced about 1872 (McChristian 1997a).

Fort Ellsworth yielded one such brass adjustment hook, illustrated in Figure 4.2d and Plate 8 (top middle). The hook is about 1 9/16 inches long; the dome is just short of 2/3 of an inch in diameter. The shaft is made of .15 inch round stock. Kapler (1994:82) found an identical specimen at Fort Sisseton, SD (military occupation 1864 to 1889). The hooks are also found at Civil War sites (see Crouch 1995:145).

Brass Triangular Ring

Brass triangular rings are believed to have been used only on knapsacks (McChristian 1997b). Todd (1974:206, 208) illustrates and describes rings of this sort used on the regulation U.S. double-bag knapsack (ca. 1853-1872). On this bag, the right armpit strap fit with a triangular ring, which fastened to a hook at the bottom of the knapsack.

The specimen from Fort Ellsworth is made from a single length of brass wire stock, about .15 inch in diameter, machine bent to form the triangle. The ring measures 1 3/8 inches by one inch.



No. 155.
Brass Scale, for Privates.

Figure 4.3. Brass scale for privates showing position of shoulder scale wing stud (from Schuyler, Hartley and Graham 1985:70).

Belt Catch

Belts used by soldiers - sabre belts by cavalrymen, and waist belts by infantrymen and others - included a belt plate and a catch at opposite ends. To fasten the belt, the catch was affixed to a hook on the underside of the plate. The two-inch wide catch from Fort Ellsworth is made of cast brass. It is illustrated in Figure 4.2e and Plate 8 (middle). This catch fit the pattern 1851 belt plate (cf. McChristian 1995:26, 27). The pattern 1872 infantry belt plate also accepted the catch, as did the 1874 cavalry sabre belt (cf. McChristian 1995:84, 92, 199) (cf. McChristian 1995:84, 92). By 1874, the plate and catch on infantry belts changed to include a strap guide for the Palmer brace yoke (cf. McChristian 1995:185, 190). But the catch seems to have remained the same, or nearly so, on the pattern 1874 sabre belt (cf. McChristian 1995:199; Steffen 1978:183).

Strap Hooks

Brass strap hooks evidently functioned in several capacities, and over at least a 30 year period. An 1878 Watervleit drawing of pattern 1878 military equipment illustrates such hooks used on the infantry cartridge belt, and to attach the canteen strap to the canteen (McChristian 1995:224). They were used on earlier military equipage too. Crouch (1995:145) illustrates hooks like the specimens found at Fort Ellsworth (Figure 4.2f), and attributes them to Union knapsacks from the Civil War. In fact, Todd (1974:207) pictures these hooks attached to straps on the regulation U.S. double-bag knapsack, an item adopted ca. 1853 and replaced around 1873 (McChristian 1997).

There are two Fort Ellsworth hooks, both of brass. The devices consist of a single brass wire shaped to form a hook with strap guide. If the specimens originally had rollers on the guide, they are missing. Both are made of the same diameter round stock (~.15 inch), and both accepted up to 1 1/4 inch strap. The two are about 1 9/16 inches wide. One is more squat than the other (1 7/16 inches), with the difference in height about 3/8 inch.

Strap Studs

Brass studs used for decades on various military belts and straps served attachment and adjustment functions. They were used, for example, on the regulation U.S. double-bag knapsack (ca. 1853-1872) to attach the shoulder, armpit and breast straps (Todd 1974:208). The specimens from Fort Ellsworth, all complete, are about 2/3 of an inch long. Diameters of the domed heads are 5/8 of an inch.

Insignia

Two insignia, both fractured, are stamped from sheet brass. One is a partial "7" (Plate 9, bottom right). Maximum width is 5/8 inch. The specimen (.3 gram) is now 11/16 of an inch high. Presumably it was originally a one-inch insignia. In any case, it denoted a regiment of any of the various Army branches. Inch and 1.5 inch regimental insignia have been found at Fort Abraham Lincoln, ND (1873-1892) (Emerson and Fox 1991:167).

The other specimen (1.0 gram) has not been identified (Plate 4, middle left). McChristian (1997a) suggests it is a fragment from a U.S. Army pattern 1858 dress hat eagle. This insignia was used to pin up the brim of the so-called Hardee hat. If so, the specimen dates during the period 1858-1872. What remains of the insignia is also shown in Figure 4.2g.

Line-Eagle Device Buttons

Other buttons are described in the Apparel and Accouterments section (Buttons). Those buttons known to be associated exclusively with military-issue clothing are described here. They consist of general service line-eagle device buttons, 10 in all. The specimens, not all of which are complete, are shank buttons made of sheet brass.

All but one general service button is $\frac{3}{4}$ of an inch in diameter. Buttons of this size were used by enlisted men to close the tunic (Herskovitz 1978:39-40). Diameter of the remaining specimen is $\frac{9}{16}$ of an inch. Typically these were tunic sleeve buttons, or worn on kepis. Buttons of both diameters are illustrated in Plate 24.

Seven of the 10 general service buttons are backmarked. One mark is SCOVILL MFG CO WATERBURY; the other, found on a single specimen, is WATERBURY BUTTON CO *. In 1849 the latter, after a pedigree beginning in 1812, became the Waterbury Button Co. That name was changed to Waterbury Companies, Inc. in 1944 (Luscomb 1967:220).

Herskovitz (1978:41) dates the Scovill backmark listed above to 1850-1960. Herskovitz's beginning date is evidently the year when the firm became the Scovill Manufacturing Co, which Luscomb (1967:174) places at 1850. Brinckerhoff (1972:5) dates the inception of this mark to 1855, but he uses the year the U.S. Cavalry was formed.

Regardless of backmark, the line-eagle style used on all 10 general service buttons found at Fort Ellsworth was first authorized in 1851 by General Order No. 31, Adjutant General's Office (Herskovitz 1978:40). In 1884, the style (shield, wings, neck) was altered slightly (Brinckerhoff 1972:5). So the Fort Ellsworth general service buttons were manufactured between 1851 and 1884.

Saddle Guard-Plate

Actually there is no way to tell if the single iron guard-plate found at Fort Ellsworth is from a military-issue saddle. Nonetheless, it does fit the description for a Model 1859 McClellan saddle, which was equipped with seven iron guard-plates, one at the pommel and six at the cantle, each fastened with brass screw-pins (Steffen 1978:61). All were the same size.

The guard-plate from Fort Ellsworth is, as expected, oval in shape - $1\frac{1}{2}$ inches by $\frac{7}{8}$ inch. Portions of a brass tack remain. Military and non-military saddles earlier and later than 1859, however, were equipped with similar or like guard-plates, so this specimen is a poor temporal indicator.

Military Ammunition

Various cartridge cases, primers and bullets are in the Fort Ellsworth inventory. Some of these, including Gallagers and Spencers, are military. These and all other ammunition components are described in the Ammunition section.

Mess and Cooking Gear

These items are described in the Personal Items section (Eating and Cooking Gear). They are essentially civilian in nature. This is either because they were used by civilians, or because they reflect a pre-1872 Army policy that required soldiers to purchase their own personal mess gear (or both) (McChristian 1995:98), available only from civilian sources.

Ammunition and Related Items

Numerous ammunition components are non-military, late 19th and 20th century specimens, one dating no earlier than 1964. Others were used during the 1850s and 1860s by the U.S. military in official-issue firearms. These arms, however, were for the most part also available on the civilian market. So, on the basis ammunition components alone, there is no sure way to put the military at the site. For this reason, all ammunition components are discussed in this, a non-military category (a single category also avoids scattering the ammunition discussion through the text).

Clearly, however, certain military equipment and accouterments show that the military was at Fort Ellsworth. Just as clearly, then, the 1850s and 1860s ammunition component types treated below have a good probability of deriving from the military presence. These include, for example, Gallager and Spencer cartridge cases, and in the bullet type, Springfield rifle and carbine "Minie balls". Other types discussed here are shotshells (all of which are non-military), primers, jacketed bullets (also non-military), lead shot bars, and sprue.

Cartridge Cases

Representative cartridge cases are illustrated in Figure 4.4 and Plate 10. The assemblage includes three fragments (.7 to 1.7 grams) torn from the bodies of either cartridge casings or shotshells. One of these (1.4 grams) exhibits a thin band filled either with a decoration or unintelligible letters. A fourth specimen (.9 gram) is a ca. .48 caliber cartridge case body (base is missing) which has a V-shaped cut.

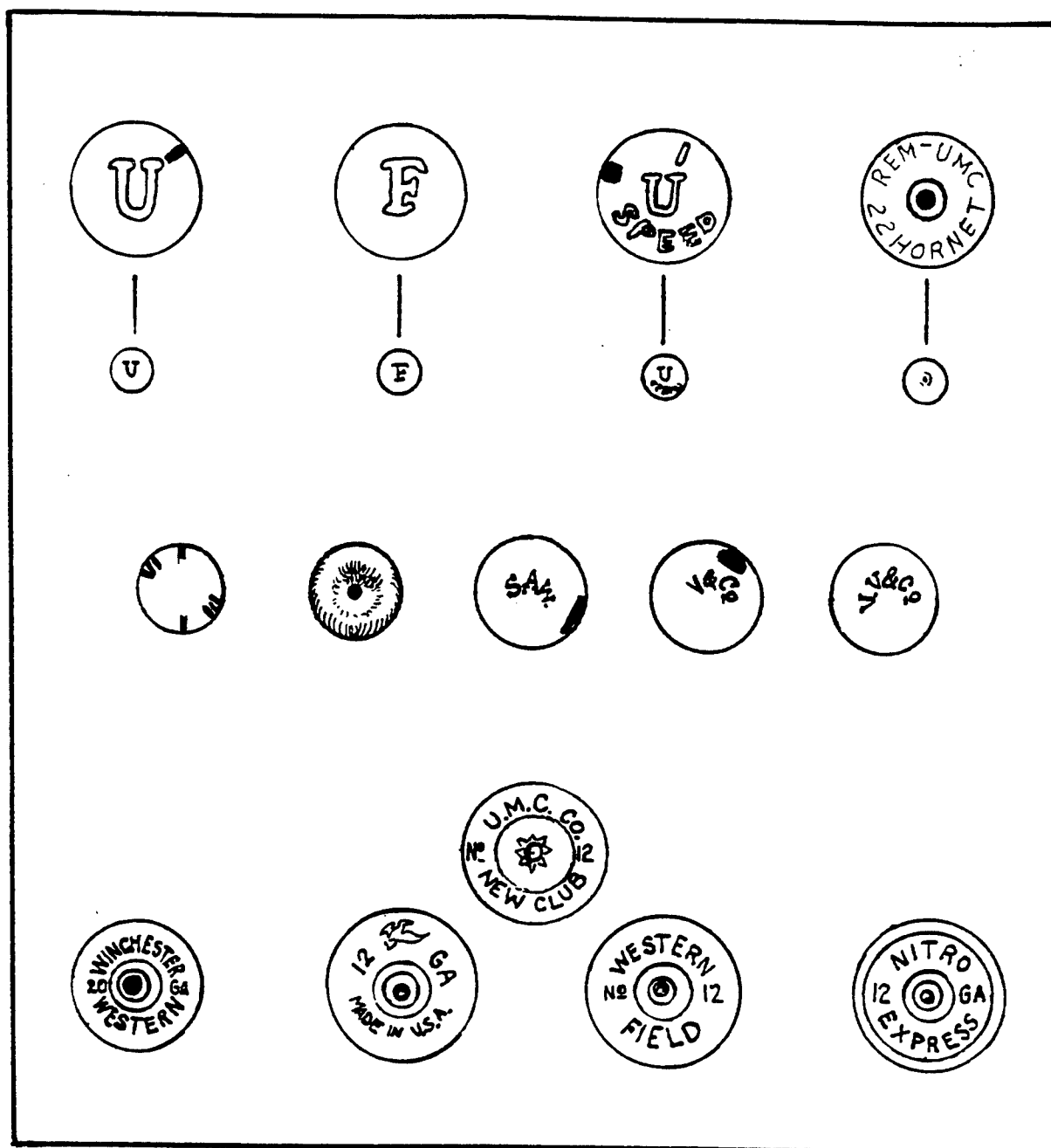


Figure 4.4. Dated cartridge cases and shotshells, Ft. Ellsworth (14EW26), Locality 6. Incomplete headstamps shown as they appear. Top row actual size and 3x; others actual size.

Top - .22 Union Metallic, Remington-Union Metallic, Remington "U" (1885-present); .22 Federal Cartridge Corp. "F" (after 1924 or 1927); .22 Remington "Hi Speed" (after 1927); Remington-Union Metallic "22 Hornet" (ca. 1930-1960).

Middle, l-r: .44 Henry (?) (from 1860); .50 Gallagher (1860s); .50 Spencer "S.A.W.", Sage Ammunition Works (1864-1866); .50 or .52 Spencers "F.V.V. & Co.", Fitch, Van Vechten & Co. (1865-1866).

Bottom - Shotshells: Union Metallic "New Club" (1892-1911); Winchester "Western" plastic case (after 1964); Western Auto "Made in USA" (after 1931); Western "Field" (1900-1931); Union Metallic-Remington "Nitro Express" (ca. 1911-1960).

Military-issue ammunition includes eight Gallagher cartridge cases, all in .50 caliber. These are from separate-primed cartridges (after Logan 1959:30). The specimens are in varying states of preservation. Gallagher cartridges were used with the Gallagher carbine patented by Mahlon J. Gallagher in July, 1860 (Patent No. 29,157) (Reilly 1970:131).

Caliber .50 Gallagher cartridges came in three types: 1) paper and foil, 2) a tinned case, and 3) a brass case (McKee and Mason 1980:78, 86). Those from Fort Ellsworth are brass. Burnside (1961:77, 78) states that not all Gallagher cartridges were .50 caliber; he illustrates Gallagers in what are said to be .52 and .54 calibers. Gluckman (1965:332) also discusses a .52 caliber cartridge for the Gallagher.

The government received its first Gallagher carbines and ammunition on February 3, 1862, and the last on December 10, 1864 (McAulay 1981:40, 42). By the end of the Civil War, weapons chambered for self-contained metallic ammunition had made separate-primed arms obsolete, including the Gallagher carbine. This is illustrated by the purchase in 1865 by the Union of 5000 Gallagher carbines chambered for the Spencer cartridge (Reilly 1970:131), a self-contained metallic round. McAulay (1981:42-43) is in agreement, noting that by 1865, the Ordnance Department had turned to Spencer carbines, and rimfire ammunition, forcing contractors to conform to this standard. So the Gallagher in its separate-primed manifestation had a short life, appearing and disappearing, at least for military purposes, within a single decade, the 1860s.

Various ammunition made for the .56 Spencer rifle are also represented in the Fort Ellsworth assemblage (n=9). These include casings from cartridges manufactured by Sage Ammunition Works (n=4), Middletown, CT (Logan 1959:191), and by Fitch, Van Vechten and Company of New York City (n=2). These specimens are headstamped (impressed) S.A.W., and FVV & C^o, respectively (headstamps on the Fitch, Van Vechten and Co. specimens are weak strikes, and thus incomplete). Also included are non-headstamped Spencer cartridge cases of unknown manufacture (n=3).

Spencer arms in military calibers used rimfire cartridges in three sizes. From 1867, these were known as 56-50, 56-52 and 56-56 Spencer cartridges. The numbers represented the diameter of the cartridge base, and the diameter of the bullet base, in that order (Gluckman 1965:390).

Christopher Spencer's original firearms, a rifle and carbine, were patented in 1860 (Patent No. 27,393) (Barnes 1993:378; Coates and Thomas 1990:35; Reilly 1970:163). These firearms were chambered for the original cartridge, the 56-56 Spencer (Barnes 1993:378). (Gluckman [1965:282, 388] says the original Spencer was a 56-52 carbine patented in 1860). Evidently Spencer made his first rifle between May 6 and May 30, 1861 (McAulay 1987:93). In the same year, the Spencer Repeating Rifle Company was organized in Boston. The company folded on September 12, 1869, and in 1870, the Winchester Repeating Arms Company purchased its assets at auction (Gluckman 1965:284; McAulay 1981:10). Many thousands were sold to civilians during the Spencer company's existence (Reilly 1970:163).

The U.S. Army used a carbine version, as well as the rifle. Beyond that, authors are at odds. According to Barnes (1993:377-378), the U.S. Army originally adopted the 56-56 Spencer carbine and rifle, and first used them at Antietam in September, 1862. Barnes continues, dating the 56-56 Spencer cartridge to 1862, the 56-52 Spencer from 1866, and the 56-50 from 1865. The latter round was made for the Model 1865 Spencer 56-50 carbine which, arriving too late for the Civil War, was used to fight Indians on the western frontier. According to Gluckman (1965:389), the Model 1865 56-50 Spencers, made by the Burnside Rifle Company (Providence, RI), were delivered between April and November, 1865. He agrees with Barnes - they were used on the western frontier.

According to Reilly (1970:61), the first Spencer repeating Army rifle was a 56-52 (Reilly 1970:61). Coates and Thomas (1990:48) state that the carbine was not issued by the Army until 1863, also in 56-52 caliber. They note that government deliveries were made in October, 1863, but that some military personnel had earlier purchased them privately. Reilly (1970:163) further states, without identifying calibers, that Spencer's repeating arms first appeared in combat during the Peninsular Campaign, late in the Spring of 1862 (Reilly 1970:163). McAulay (1981:11-12) dates the first government procurement of Spencer carbines to October 3, 1863, and the last on October 31, 1865.

The Spencer was the principal U.S. Cavalry carbine during part of the Indian war period - from 1866 to 1873 (McAulay 1981:10). Spencer firearms remained in use long after the company disappeared, creating a demand for cartridges, which continued to be manufactured. Barnes (1993:377-378) has found all three calibers advertised as late as 1920. For this reason, the non-headstamped 56-52 cartridges in the Fort Ellsworth assemblage are only tentative temporal indicators. Such is not the case, however, for the Sage and Fitch, Van Vechten specimens, which can be tightly dated (manufacturing dates) regardless of caliber to a few years in the mid-1860s. Likely the non-headstamped Spencers date to the same period.

Dennis Sage and neighbors formed the Sage Ammunition Works early in 1864 (Barber 1987:34). According to Barber (1987:34-35), Sage had government contracts for 56-50 and 56-56 ammunition. If Barber is correct, The Fort Ellsworth specimens must then be 56-50 caliber Spencers, because only Sage's 56-50 Spencer round had a headstamp (Barber 1987:35). In any case, the 56-50 and 56-52 Spencer ammunition were interchangeable, and any arm chambered for one would fire the other (Barnes 1993:378). Sage Ammunition Works did not last long, going out of business on October 24, 1866 (Barber 1987:35).

Fitch, Van Vechten and Co. (FVV) was a partnership between Josiah P. Fitch and Julius R. Van Vechten. They produced rimfire ammunition between 1864 and 1865. FVV ammunition boxes indicate the company produced the entire Spencer rimfire series. FVV became the New York Metallic Ammunition Company (1865-1867), which became the American Metallic Ammunition Company (1867-ca. 1870), and then the H.W. Mason and Company (ca. 1870-1874). The original FVV machinery was used by the latter the companies, but evidently only FVV used the FVV & C^o headstamp (Barber 1987:25-27). This would date the Fort Ellsworth specimens, either 56-50, 56-52 or both, during the period 1864-1865. White and Munhall (1977:21) disagree slightly, dating the headstamp to 1865-1866.

Three of the four other headstamped cartridge cases - all in .22 caliber - date to the 20th century. The fourth, made of brass, may or may not be that late. It is a rimfire specimen, a .22 long, headstamped with an impressed U. The U headstamp has been used from 1867 to date by the Union Metallic Cartridge Co. (1867-1911), the Remington Arms-Union Metallic Cartridge Co. (1911-1927), and the Remington Arms Co., Inc. (1927-present) (White and Munhall 1977:31). The Union Metallic Cartridge Co. began using the impressed U headstamp in 1885 (Barber 1987:48), dating the Fort Ellsworth specimen to no earlier than that year.

One of the 20th century cases, a brass .22 long rimfire, is impressed with an F, representing the Federal Cartridge Corp (FCC). The FCC was incorporated April 1, 1922. The company made its first rimfire ammunition in 1924, which was headstamped with F either in that year (Barber 1987:75), or in 1927 (Barber 1987:80). Headstamps on all FCC ammunition were changed to F in 1964 (Barber 1987:80). The company is still in existence (Barber 1987:75). This specimen dates after 1924 or 1927.

Another non-ferrous .22 long rimfire is silver in color, and is probably nickel-plated brass. The specimen's headstamp is an impressed U HI SPEED. "Hi Speed" encircles the rim, and U is in the center of the base (HI is a weak strike). The headstamp is shown in Barber (1985:195). This ammunition was made by Remington Arms Co., Inc., incorporated in Delaware on May 24, 1920 (Barber 1987:48). Remington began making cartridge cases in nickel-plated brass (as well as in steel and blackened nickel-plated brass) in 1927, and continues to do so today (Barber 1997:82). So this specimen dates from 1927 to the present.

A bottleneck (reduced) cartridge case is 1 1/4 inches long. The .22 caliber centerfire specimen is externally primed. The headstamp reads REM-UMC 22 HORNET. REM-UMC (Remington Arms-Union Metallic Cartridge Co.) headstamps postdate 1911, but the .22 Hornet is later. It was developed at the U.S. military Springfield Armory during the late 1920s. Winchester produced the first commercial .22 Hornet in 1930. Within a few years the Hornet was standardized by all American manufacturers. This round - intended for varmints and small game - was the pioneer small bore, high velocity cartridge in the United States (Barnes 1993:17; Dunlap 1994:88-89). Vinson (1968:91) indicates that the REM-UMC headstamp was used until 1960, at least for shotshells. If this *terminus ante quem* date applies to the Fort Ellsworth specimen, then it dates from ca. 1930 to 1960.

Three other rimfire cases lack headstamps. Two are cuprous (probably copper) .22 caliber shorts of unknown age and manufacturer. The third specimen exhibits two sets of double-strike firing pins. One set may be from a .44 caliber Henry or Winchester. If so, then it dates from 1860 or 1861 (Barnes 1993:376). The now-crushed specimen is about .84 inch high. Early .44 Henry short cases were .815 inch high (Barnes 1993:376).

Summarizing, cartridge cases from Fort Ellsworth that have a strong likelihood of being used in government-issue firearms are the Sage and FVV & Co. Spencers, and the Gallagers. Standing alone, they indicate a site date of 1864 to 1866. Support for this range comes from the absence of .50 caliber Springfield metallic cartridges. Absence suggests that the military no

longer occupied Fort Ellsworth by 1866 or 1867. The new .50 caliber Springfields - called the Model 1866 - featured the Allin conversion. By 1867, the U.S. Army had accepted 50,000 Allin-conversion Springfields (Utley 1973:69). Until about 1867, the standard infantry rifle was the .58 caliber Springfield rifled musket, a percussion muzzle-loader. The Allin conversion changed .58 Springfields (most of them) in two ways. The weapon was modified to fire a metallic cartridge loaded at the breech, and the bore was reduced to .50 caliber by installing a barrel tube.

The absence of Allin-conversion ammunition components in the Fort Ellsworth assemblage could be due to various factors (chance recovery, issuance to certain troops or posts, etc.). But the new weapon reached the hands of regular infantry troops in time for the Hayfield (Montana) and Wagon Box (Wyoming) fights of 1867 (Utley 1973:71). So it did appear rapidly on the frontier. Further, the assemblage does contain .58 caliber Springfield "Minie" balls (see Bullets), showing that the rifled musket was at Fort Ellsworth. Currently little reason exists to suspect that the Allin conversion would not have replaced it had Fort Ellsworth been occupied after 1867.

Shotshells

The shotshell assemblage (n=5) from Fort Ellsworth postdates 1890, and most are 20th century specimens (Figure 4.4). All are 12 gauge save one in 20 gauge. Probably the earliest shotshell is a specimen headstamped U.M.C. N°. 12 NEW CLUB. The 8-point star around the external primer is one of three New Club varieties (another variety has two concentric rings, and the other has nothing) (Moos 1968:41).

This 12 gauge New Club dates between 1892 and 1911. The Union Metallic Cartridge Co. (UMC) began making it in 1892 (Moos 1968:40). In 1911, UMC began a merger with Remington Arms and Ammunition Company which in 1916, with the Robin Hood Ammunition Company, resulted in the Remington Arms-UMC Company (Barber 1987:48). As a consequence, UMC ammunition began to be stamped REM-UMC in 1911, or perhaps 1910 (Iverson 1988:119, 120; Vinson 1968:91).

Another shotshell is headstamped WESTERN N° 12 FIELD. Parts of the wad and orange paper adhere. A thin, diamond-filled band encircles the case near the rim. This ammunition was made by the Western Cartridge Company (WCC), founded in 1900. WCC purchased the Winchester Repeating Arms Company in 1931. By 1970 virtually all of the company's ammunition was headstamped Winchester-Western, or W-W (Iverson 1988:163-164). Thus this specimen at the least dates between 1900 and 1931.

A high-brass shotshell is headstamped NITRO 12 GA EXPRESS. UMC-REMINGTON is impressed in a thin band around the case near the rim. These stampings were used by Remington-UMC from about 1911 until 1960, the year that REMINGTON-PETERS began to be used (Iverson 1988:120).

A 12 gauge shotshell made by the Federal Cartridge Corporation, formed in a 1922 reorganization, was distributed by Western Auto Supply Company of Kansas City, MO (Iverson

1988:70, 71, 163). The shotshell headstamp reads 12 GA MADE IN U.S.A., and features a duck in flight between the 12 and GA. Portions of the paper wad remain in this specimen.

Western Auto, started by George Pepperdine, began in 1909 as Western Auto Supply Agency. Originally a mail order firm for Model T parts, Western Auto entered the sporting goods, ammunition and gun business in 1931 (Iverson 1988:163). So this shotshell dates no earlier than 1931.

The single 20 gauge shotshell features a headstamp which reads WINCHESTER WESTERN 20 GA. As noted, this headstamp is the result of a merger in 1931 between the Western Cartridge Co. and Winchester Repeating Arms Co. The specimen, however, exhibits a melted plastic wrap. Winchester-Western introduced its first plastic-wrapped shotshell in 1964 (Labisky 1973:152), so this specimen probably dates after that year.

Primers

Primers (n=10) used with separate-primed small arms include top hat and cup variety percussion caps (Plate 25, top row). All eight top hat specimens are #8 standard size. The two cup percussion caps measure .1765 and .17 inch in diameter. These could have been used on a variety of firearms, civilian or military, including the .58 caliber Springfield rifled musket which appears - judging from an appendage (see Military Equipage and Accouterments) and bullets (see Lead Bullets, this section) for this firearm - to have been present at Fort Ellsworth.

Lead Bullets

The assemblage includes bullets (n=35) and balls (n=2) in four categories - fragmented, mushroomed, "sliced", and largely intact. All are ofunjacketed lead. Jacketed bullets and jackets are described in the section below.

The fragment, originally a flat-base bullet around .45 caliber, is shorn lengthwise and badly deformed. A ball is too deformed to size. The six mushroomed specimens are also badly deformed. They include bullets in sizes ranging from (approximately) .32 to .44 caliber.

Three unfired bullets have been purposely modified by hand, probably as a pastime. All exhibit three cannalures and conical concave bases. One has been neatly sliced in half lengthwise (Plate 25). It is a .58 caliber bullet probably used in Springfield rifled muskets. The .58 Springfield rifled musket was first adopted by the U.S. Army in 1855, and, with the advent of breech-loaders which used metallic cartridges, phased out by 1866.

The two others are lower portions of the bullet, having been sliced horizontally. The diameter of one varies from .565 to .570 inch, and the other varies between .562 and .575 inch. These are bullets for weapons, probably Civil War era muskets or rifled muskets, in the .56 to .58 caliber range.

The 26 intact or largely intact bullets and balls range in caliber from .22 to .58. The single ball is approximately .44 caliber. This specimen (137.3 grains) was fired in a rifled firearm, probably a musket, the barrel rifling leaving a faceted band which encircles the ball (Plate 25). The process also left a slightly elongated ball. McKee and Mason (1980:68) depict and describe similar Civil War era specimens.

A single .22 caliber bullet (38.6 grains), probably a .22 long, exhibits one cannalure and a slightly cupped base (Plate 25). The next size represented is a .25 caliber bullet (74.1 grains) which exhibits three concentric crimp mark bands and a slightly indented base (Plate 25). Types of these two specimens have not been determined.

Two .36 to .38 caliber bullets (lacking cannalures) with flat noses and bases exhibit barrel rifling facets (Plate 26). Very likely they are from sidearm ammunition, but temporal provenance has not been determined. One specimen, weighing 120.4 grains is .444 inch long, and varies from .370 to .376 inch in diameter. The second is nearly the same - a 118.8 grain bullet that is .484 inch long. Diameter varies between .367 and .385 inch.

A bullet with three raised ridges has a diameter ranging from .351 to .358 inch (Plate 26). The specimen is .69 inch long. According to McChristian (1997a), this is modern bullet which could have been fired from either a .38 Special or .357 Magnum. The latter was introduced by Smith and Wesson in 1935 (Barnes 1993:235). The Special, introduced by Smith and Wesson in 1902, is somewhat earlier (Barnes 1993:237).

Another bullet (120.4 grains), snub-nosed and flat-based, exhibits barrel rifling facets (Plate 26). Height is .494 inch, and diameter ranges from .3755 to .3855 inch. This too was probably used in a revolver, perhaps a .38 caliber. Two raised-ridge bullets are in .44 caliber (Plate 26). Both exhibit two ridges, a flat nose and flat base. One specimen (234.6 grains) is .7525 inch long, measuring from .417 to .426 inch in diameter. The second (213.0 grains) is .6765 inch long; it varies in diameter from .415 to .425 inch. According to McChristian (1997a), these are probably modern bullets likely fired from a .44 Magnum (introduced in 1955 [Barnes 1993:246]), or .44 Special (introduced about 1907 [Barnes 1993:245]).

Six bullets probably represent .44 caliber ammunition. Four are roughly conical in shape, and each has a flat base. Two conical specimens (182.1 and 208.3 grains), each with a single cannalure, are probably for .44 Colt Army, Early Model revolver ammunition (cf. #82, #83 in Mason and McKee [1980:26, 27]). One is .6825 inch long; diameter ranges from .459 to .4620 inch (Plate 26; middle, bottom row). The other (Plate 26, lower left) is shorter (.5855 inch long). The Army adopted the .44 Colt Early Model in 1847 and continued to use it until 1855, when it was replaced by the Colt Model 1851 "Navy" (Kopeck and Fenn 1994:225). This model, however, remained in general use throughout the Civil War.

A third conical bullet (217.7 grains) has two cannalures, a flat base, and is .693 inch long. The specimen is very similar to the .44 caliber Colt revolver and "Sage waterproof cartridge for revolver" bullets shown in McKee and Mason (1980:28, 29 - #122 and #123). The fourth .44 caliber conical (208.3 grains) is a single cannalure, flat-base bullet that is .6825 inch long (Plate

26, lower right). Diameters range from .445 to .450 inch. McKee and Mason (1980:26, 27 - #82 and #89) illustrate similar bullets, these from the Civil War era, and attribute them to ammunition for an unknown and .44 Colt revolvers.

One of the two bullets could date to quite a short period - the Sage Ammunition Works was in business from 1864-1866 (see Cartridge Cases for details). The two seem at the least to date before the Army shifted to .45 caliber sidearms. The U.S. Cavalry adopted the .45 caliber Model 1873 Colt revolver in 1874 (Kopec and Fenn 1994:229), and it became the official Army sidearm (all branches) in 1875 (Barnes 1993:250). Before 1875, the Army-issue revolver was the .44 caliber Model 1860 Colt revolver, officially adopted in 1861 (Kopec and Fenn 1994:225).

A fifth .44 caliber bullet (209.9 grains) has a pyramidal nose in cross-section (Plate 27, upper left). The bullet is flat based and has a single cannalure which is nearly obliterated. The specimen is .612 inch long; diameter ranges from .4380 to .4415 inch. This probably was used in a revolver, but the type is unknown.

The sixth .44 caliber bullet has a pin or rebated base (after McKee and Mason 1980:18) that is .43 inch in diameter (Plate 27; middle, top row). The specimen swells from the base to mid-body, where a conical taper begins. Its specifications (diameter range at mid-body is .450 to .458 inch; height is .789 inch; weight is 257.7 grains) and morphology are close to several bullet types described and illustrated by McKee and Mason (1980:58, 59 - #488 through #491). These are an early model Colt Dragoon, or Colt Dragoon (both from 1848 to 1855), an early model Colt Army revolver (from 1860 to 1875) (dates from Kopec and Fenn 1994:225; Reilly 1970:200-202), or a Colt revolving rifle. The latter, the Model 1855 Colt, were delivered to the Army between 1857 and 1866 (Reilly 1970:43).

An elongated conical specimen (206.0 grains) is a picket-type bullet for a country rifle (Plate 27, top right), a Civil War era firearm (cf. McKee and Mason 1980:22, 23 - #21 or #22; Crouch 1995:107). Probably it is a .46 caliber bullet; diameter ranges from .444 to .474 inch. The flat-base specimen is .74 inch long. The bullet exhibits a slightly knurled tip, indicating an attempt has been made to remove it from the barrel with a threaded tool.

A .52 or .54 caliber bullet (379.6 grains) ranges in diameter from .523 to .533 inch (Plate 27; left, middle row). This specimen, .86 inch long, exhibits three cannalures and a flat base. It is similar to those illustrated in McKee and Mason (1980:30, 31) for a Merrill carbine. The first Merrill carbine patent was issued in 1858. Others followed in 1861. The U.S. Government purchased Merrill carbines during the Civil War years (Reilly 1970:146).

One specimen, with three cannalures and a concave conical base, is a 461.4 grain bullet from a Gallagher cartridge (Plate 27; right, middle row). The bullet's diameter ranges from .534 to .542 inch, and it is .942 inch long. Most likely it is from a .54 Gallagher ammunition, which is illustrated in McKee and Mason (1980:56 - #442). Burnside (1961:77, 78) states that not all Gallagher cartridges were .50 caliber; he illustrates Gallagers in what are said to be .52 and .54 calibers (for temporal provenance of Gallagher arms, see Cartridge Case section).

The remaining nine bullets represent .56 to .58 caliber ammunition, and at these calibers likely all were intended for use in Civil War era muskets or rifled muskets. All save one exhibit three cannalures and variations on the concave conical base. The exception is a two-cannalure snub-nose bullet with a pin base (Plate 27, lower left). This specimen is .689 inch long; diameter ranges from .572 to .577 inch. The bullet remains unidentified.

Listed below are dimensions (in inches) and bullet weights (in grains) for the remaining .56 to .58 caliber bullets.

1. ht= .9445, dia=.5660 to .5705, wt=439.8
2. ht= .9900, dia=.5700 to .5810, wt=475.3
3. ht=1.0245, dia=.5670 to .5725, wt=510.8
4. ht= .9860, dia=.5720 to .5785, wt=478.4
5. ht= .9680, dia=.5650 to .5720, wt=496.9
6. ht= .9690, dia=.5620 to .5750, wt=455.2
7. ht=1.0000, dia=.5620 to .5700, wt=438.3
8. ht=1.0650, dia=.5710 to .5750, wt=476.8

No. 1 above, illustrated in Plate 27 (middle, bottom row) is similar to a bullet that McKee and Mason (1980:50, 51) identify as .58 caliber for rifle or rifled musket. Specimen #2 is probably a .577 or .58 caliber bullet.

Specimens #3, #4, #5 and #6 above are morphologically identical bullets that were probably used in .58 caliber Springfield rifled muskets (1855-ca. 1866). The tip of specimen #5 has a deep hole bored with a ball screw. This indicates use in a musket or rifled musket, and a malfunction that resulted in an attempt to remove the projectile from the barrel.

Specimens #7 and #8 are also morphologically identical. McKee and Mason (1980:52, 53 - #394) illustrate a similar bullet, which they identify as .577 caliber for rifle or rifled musket. Specimen #8 above is illustrated in Plate 27 (lower right).

Jacketed Bullets and Jackets

The inventory contains 11 lead bullets with all or parts of their jackets, and jacket fragments. The metal jacketed bullet was developed in Switzerland in 1880 (Logan 1959:9), and is produced today in a variety of types.

Specimens from Fort Ellsworth include a mushroomed bullet (~.42 caliber) with a mangled tin or nickel jacket. Otherwise, all jackets are cuprous, probably copper or an alloy. One is a .32 caliber (approximately) jacketed bullet deformed on impact. Two others are slightly deformed jacketed bullets of the same type and caliber. These measure about .35 inch in diameter. Three specimens, one of which is illustrated in Figure 4.2 (lower right), are unfired .30 caliber bullets (1.045 inches long) from a high-powered rifle ammunition. The remaining four specimens are badly torn bullet jackets varying from about .24 to .42 caliber.

Lead Bars

Lead bars were a common item on the frontier. They were used in the field to make bullets, balls and shot. A leading 19th century lead bar manufacturer was the St. Louis Shot Tower Company. Between about 1850 and the turn of the century, this company produced large quantities of shot and lead bar stock used on the western frontier (Switzer 1970:5-6). According to Hanson (1967:5), the years between 1850 and 1875 saw vast quantities of St. Louis Shot Tower lead shot, trade balls and small bar lead reach the frontier. In 1858 the original partnership was reorganized as a corporation, and evidently in that year the firm became the St. Louis Shot Tower Co. (Hanson 1967:4, 5; see Anonymous [1973] for more on the company).

Switzer (1970:5-6) describes St. Louis Shot Tower Co. small bar lead found on the Bertrand, which sank in 1865. They are 10 3/8 by 1/2 by 5/16 inches thick, the size resulting in a one pound bar. Each is impressed with ST. LOUIS SHOT TOWER CO. The six small bar lead fragments from Fort Ellsworth (Figure 4.5a; Plate 11) are consistent with this marking, and with width and thickness (.45 to .47 inch wide, and about .28 inch thick). One reads ...OUI..., and four others which refit read TOWER CO. The sixth specimen is impressed TO... (i.e., a second TOWER). A minimum of two bars is represented, and perhaps three.

Switzer (1970:4-5) dates the Bertrand bars no earlier than 1858, the year the St. Louis Shot Tower Co. was incorporated. The Fort Ellsworth bars doubtless have the same *terminus post quem* date. A conservative time range for the Fort Ellsworth specimens would be 1858 to 1900. If the Fort Ellsworth bars reached the site during the height of the company's trade on the frontier, the date range would be tighter, from 1858 to about 1875.

Sprue and Other Lead

Sprue fragments from the excavations total 12. The largest weighs 65.9 grams; the smallest 2.0 grams. Three other amorphous fragments may or may not be sprue. One 4.9 gram specimen is a bent and folded sheet, rather than a blob. Two others (2.0 and 23.2 grams) are pieces of laminated lead, the smaller of which is folded over. Both specimens are illustrated in Plate 12 (top, bottom left). The lamination might have formed as molten lead regularly dripped in the same spot. They could also be remnants of the foil which came wrapped around some bottle closures. Perhaps as a pastime, someone saved foil wrappers by stacking one on the other.

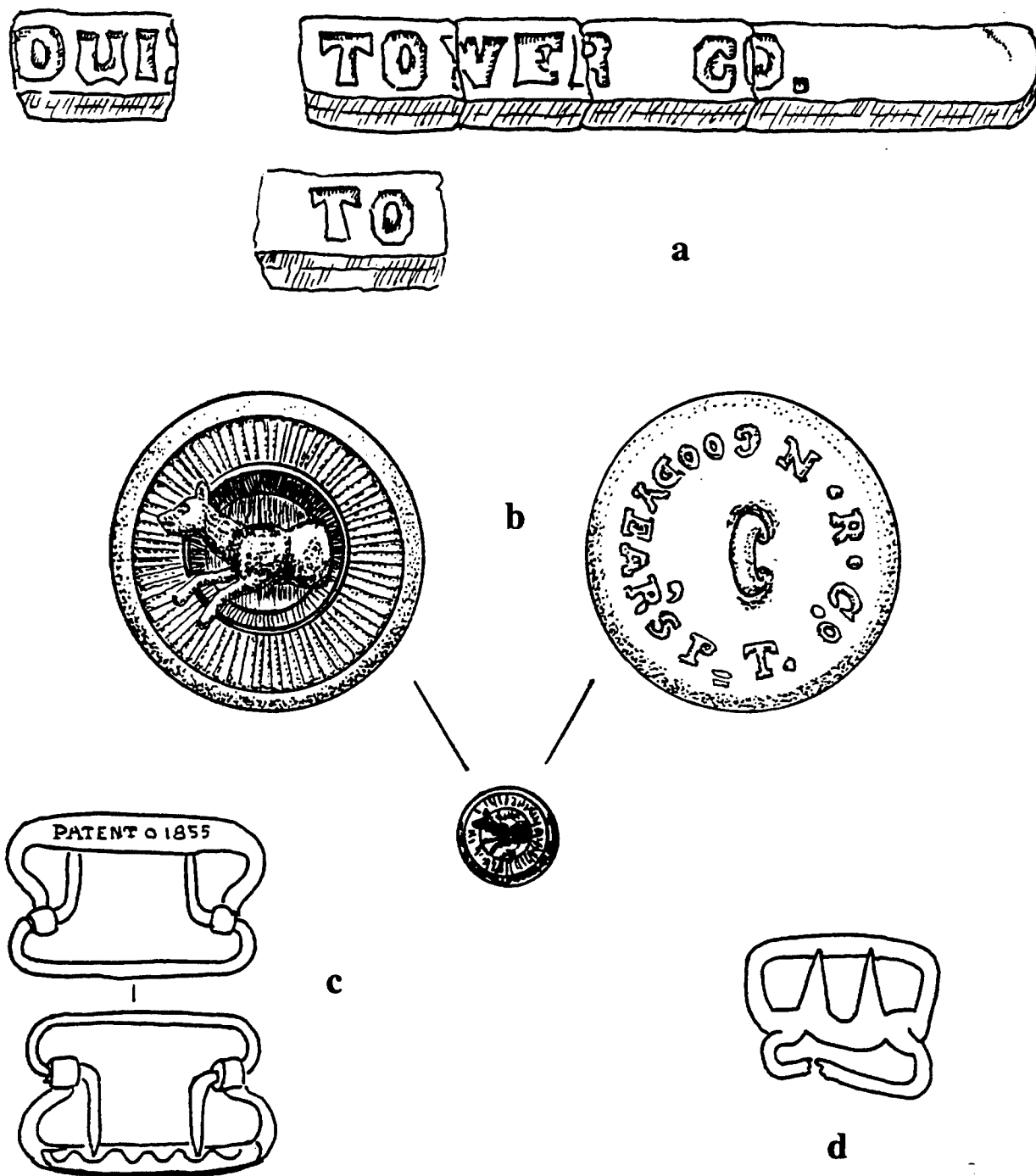


Figure 4.5. a) fragments from a "St. Louis Shot Tower Co." small lead bar; b) Novelty Rubber Co. hard rubber fancy button, shanked (actual size and 3x actual); c) Hartshorn buckle, patented July 10, 1855 (ferrous/brass); d) Hartshorn buckle (ferrous). Items a, c-d actual sizes. Ft. Ellsworth (14EW26), Locality 6.

Apparel and Accouterments

Apparel artifacts without obvious connections to military uniforms and clothing make up this category. They represent apparel such as shirts or blouses, rain gear, perhaps hose, vests or suspenders, and footwear. For the most part, these artifacts represent mundane, functional apparel, with scarcely a hint of fashion.

Buttons

Described here are non-military buttons, and buttons which cannot definitely be identified as military issue. Military specimens (Plate 24), all general service line-eagle device buttons, are covered in the Military Equipage and Accouterments section (Line-Eagle Device Buttons). Presented here are milk glass, shell, iron, rubber, fancy and pewter buttons. Buttons, perhaps types like these, were sold by the sutler at Fort Ellsworth (Baer 1996:53).

The 12 milk glass, or "white agate" buttons are all 4-hole, sew-throughs. Two representative specimens in milk glass are shown in Plate 24 (middle row). Milk glass buttons are in sizes 14 line (n=2), 16 line (n=3), 18 line (n=6), and 28 line (n=1). Buttons of this type were introduced in the United States about the 1860s (Fontana and Greenleaf (1962:98).

Two of the three mother-of-pearl buttons are plain, 4-hole sew-throughs in 16 and 18 line (Plate 24, lower left). The third specimen is a plain, 2-hole sew-through in a 22 line size (Plate 25, lower right). Mother-of-pearl buttons were introduced into the United States from France about 1855 (Fontana and Greenleaf 1962:98). Sudderth (1992:39-40) notes that between 1855 and 1890, millions of mother-of-pearl buttons were produced domestically from marine shell obtained principally in Asia. But by 1891, American manufacturers began to make shell buttons from unionid mussels, a shellfish found abundantly in U.S. rivers. So this button probably dates between about 1855 to around 1890.

Iron buttons (n=22) are badly oxidized (as shown in Plate 28, upper left), precluding identification of manufacturer's marks if any existed, although decoration is visible on two, and several exhibit traces of the original tinning. All are 4-hole, two-piece pressed buttons, or were; a number of specimens are fragmentary. Only two sizes are represented - 24 line (n=7) and 30 line (n=15). On those with decoration (both in 30 line), one had a reeded rim. On the other, the border between the well and the rim was filled with contiguous diamonds (Plate 28, upper right). At the center of each diamond there was a dot.

Fancy buttons (n=5) are of the shank variety, and all are in glass. One, a 20 line, has a domed face in clear glass (Plate 28; middle left). The shank is missing, but the circular depression where it attached is evident. Another has a conical, undecorated face of milk glass (Plate 28; middle right). The 16 line button retains the shank. A third button, now broken, was made of bichrome glass, red-orange and white in color. What is left (shank is missing) indicates that originally the face was a half-globe shape. Two buttons are represented by two milk glass fragments that do not refit. Originally the milk glass faces were shaped in a half-globe.

The three hard rubber buttons were all made by the Novelty Rubber Company. Two are shank buttons, and one is a 2-hole sew-through. The latter has a cupped face, is in 36 line, and is backmarked N. R. C. Co. GOODYEAR'S P T. 1851 (Plate 28, lower left). Both shanked specimens are 26 line buttons. The obverses are identical - a cervid, probably a deer, leaping from the button well onto a reeded border (Figure 4.5b; Plate 9, bottom). One is backmarked N. R. C^o. GOODYEAR'S P=T., and the other N. R. C^o. GOODYEAR'S PAT. The Novelty Rubber Co., organized in New Brunswick, NJ., lasted from 1855 to 1870 (Herskovitz 1978:132; Luscomb 1967:140), dating these buttons (manufacturing date) to a 15 year period. A fourth hard rubber N. R. C. button, carved into a crude finger ring, is described in the Personal Items section (Jewelry). Hard rubber buttons often adorned rain gear.

Two non-ferrous metal buttons are probably made of pewter or white metal (see Plate 28, lower right for one). Both are identical one-piece pressed, 4-hole sew-through, 30 line, reeded border buttons. Reeding encircles the face between the button well and rim. Pewter buttons were commonly used on men's clothing in the late 18th and early 19th centuries. After the middle of the 19th century, they were popular on women's wear. The lapse between the early and mid 19th century has been attributed to the popularity of brass buttons. Pewter buttons continue to be made (Luscomb 1967:149).

Rubberized Cloth

The Fort Ellsworth assemblage includes various fragments of rubberized cloth. Cloth of this sort was used in early waterproofing efforts. In 1823, Charles Mackintosh dissolved rubber with benzene, producing a waterproofing. With this, the waterproof garment industry arose. Mackintosh's formula, however, produced a tacky surface when hot. Not until Charles Goodyear developed vulcanization in 1839 did the waterproof industry begin to grow (Brown *et al.* 1991:3-4).

The rubberized cloth fragments weigh in total about 127.5 grams. This weight includes two cuprous grommets (9/16 inch outside diameter), which are still attached to cloth fragments. Most fragments, some black, others black on tan, show a finely spaced ribbing, or weave.

Slickers and ponchos of the 19th century utilized rubberized cloth, as well as hard rubber buttons like the ones reported above. Large stocks of rubberized ponchos had been an issue item before the Civil War. During the war, the Army obtained large stocks of ponchos and ground cloths. They were not exhausted until the early 1890s (Rickey 1963:126).

Buckles

Two buckles can definitely be identified as apparel accouterments (Figure 4.5c-d; Plate 9, center). Other buckles are described in the Hardware section (Buckles, Slides and Rings). Both reported here figure in patents obtained in the same year by the same inventor, although only one exhibits a patent date. The date is on a combination ferrous/cuprous buckle, and reads PATENT J... 185... Research determined that the date is July 10, 1855, and the patent (#13,218), secured by Selden S. Hartshorn, was for an "improvement in the manufacture of buckles composed of

two pieces" (Anonymous 1856:35, 303; the patent year is incorrectly listed in this source). The frame of this buckle is decorated with an embossed vine-and-bud design.

Hartshorn obtained the other patent (#13,907) on December 11, 1855. In this patent he claimed that by constructing the "tongue and loop of the buckle in one part", there was no need for another fastening device (Anonymous 1855:35, 303). If decoration or a patent once adorned this specimen, rust has obliterated it or them. This buckle is similar to iron specimens from Fort Union, ND, one of which has an impressed rope-like design on the frame (Perry and Hunt 1986:20-21).

Herskovitz (1978:37, 38), analyzing an identical embossed specimen from Fort Bowie, AZ (1862-1894), calls it a shoulder brace and hose supporter buckle. Fontana and Greenleaf (1962:85) say it was used on vest straps or with suspenders. Perry and Hunt (1986:20, 52, 53), reporting on Fort Union, ND material culture, describe buckles morphologically identical (theirs are all iron and without the patent date) to the Fort Ellsworth embossed specimen. They state that the Fort Union buckles are "exactly like brass and black lacquered iron grip guides" found on the steamer Bertrand, which sank in 1865. The Bertrand specimens were embossed PATENT 1855. According to Perry and Hunt, this kind of buckle functioned as "a fastener for a waist adjustment at the back of men's trousers".

Hook and Eye

Hooks and eyes have been and are used to fasten various clothing, including garments. The cuprous specimen (.1 gram) from Fort Ellsworth is the hook portion only, intact with sewing holes and the bill. It is 13/32 inch long.

Grommets

Grommets in the Fort Ellsworth assemblage number eight, including the two attached to rubberized cloth fragments (see Rubberized Cloth, this section). They are in three sizes, 1/2, 9/16 and 5/8 inch (od). All are cuprous. One grommet has the shank of a cut nail driven through it - as if a grommetted canvas had been hung for, say, a room divider. Another has leather adhering, and one retains fragments of a khaki-like cloth. The grommets with nail and leather are shown in Plate 29.

Footwear

Footwear is represented in deteriorated leather sole and heel fragments (n=5), and cleats (n=2), nails, and eyelets (n=11) from shoes an/or boots. One fragment is probably from a square heel, likely from a boot. Complete with ferrous shoe nails, it weighs 4.2 grams. A second small heel fragment weighs, with four shoe nails, 8.3 grams. It was found with five loose shoe nails. Approximate standard sizes of the nine common or stout nails in and with the heel are 7/8ths (n=2) 8/8ths (n=7). A third heel fragment, also with nails, weighs 18.4 grams. Another, the largest heel fragment (27.4 grams), also with shoe nails, is U-shaped. A toe portion (from the sole) weighs 9.2 grams (with nails).

Two cuprous heel or toe cleats exhibit square nail holes, some holes with ferrous nails. One cleat was found with a heel (the 18.4 gram specimen above), suggesting it is a heel cleat. Both cleats are well-worn. Cleats of this kind, identified by one author as toe plates, have been found at (unidentified) Civil War sites (cf. Crouch 1995:143). As well, Carlson (1979:189) found similar cleats at Fort Atkinson, NE; he calls them heel plates. Fort Atkinson was occupied between 1820 and 1827, dating the use of footwear cleats on the western frontier to at least the early 19th century. Cleats, however, have remained much the same over the years, and are still utilized, making them poor temporal indicators.

The 11 eyelets are also cuprous, and are all of the same size. Inside diameters are 1/8 inch; outside diameters are 1/4 inch. In total, they weigh 1.1 grams.

Personal Items

Artifacts in this category represent activities such as sewing, writing, eating and cooking, grooming, perhaps hunting, and an habitual activity - smoking. Body adornment is seen in several jewelry items. Also included in this category are several folding knives, coins, and what may be the remnants of a coin purse. By and large, however, personal item types are not especially numerous or varied.

Sewing Paraphernalia

Sewing items include a thimble, a sail and packing needle, straight pins, and perhaps tailor's chalk. Three of the four straight pins are all in the 1 1/4 inch standard size. One is a 1 3/8 inch size pin. One of the shorter specimens is made of a non-ferrous metal; the remaining three are ferrous.

A ferrous packing and sail needle identical to the one found at Fort Ellsworth is illustrated in the reprinted 1865 Russell and Erwin (1980:434) hardware catalog. The specimen is six inches long, slightly curved at the tip, and is referred to as a #8 sail and packing needle. This size needle is and was handy for use in leather work and for working heavy cloth such as canvas.

The thimble (Plate 9, bottom) is made of a non-ferrous metal, perhaps pewter, white metal or aluminum, but apparently not brass. The crown and most of the body has pounce marks, as might be expected. The band is marked FORGET ME NOT, and the rim is reeded with marks identical to a 'T' (i.e., TTTTT... completely around the rim). The thimble is approximately size 13 (after Rath 1979:21). One thimble design located to date incorporates Forget-me-not flowers in the band, but not with printed words (Lundquist 1970:68).

The assemblage contains a single piece of chalk (2.1 grams). The specimen is roughly rectangular in cross-section, about 3/8 inch thick and 1 1/4 inches long. It may be a fragment of tailor's chalk.

Writing Instruments

The Fort Ellsworth sutler offered pens, pencils, paper and envelopes for sale (Baer 1996:53, 53). Two specimens found at the site likely from a pencil or pen (Plate 9, top left). Both are fractured. The longer, tubular item (2.1 grams) exhibits two casually carved, parallel rings around the shaft, which is hollow (a round hole). This specimen, black in color, is made of an unknown non-metal material. The other item (1.6 grams) is made of a non-ferrous metal, perhaps tin or white metal. It may be part of ferrule or finial that fit on a pen.

Other writing instruments are represented in pencil lead and a broken pen nib. Two short lead fragments, weighing .2 grams total, are rectangular in cross-section, measuring .0735 inch by .0585 inch. The material is probably graphite. Only the body remains of the pen nib (.4 gram). It is ferrous, and badly rusted. The nib is very thin, just .071 inch (approximately).

Jewelry

Several items are classified as jewelry. These are 29 beads, two tinklers, a homemade ring, a wedding band, and a concha. The beads are of the type commonly called "seed" beads. Colors are black (18), ivory (5), white (4), turquoise (1), and colorless (1). Beads like these were popular 19th trade items on the Western frontier, and they were used domestically as well.

Tinklers were also popular trade items. The two specimens in the Fort Ellsworth assemblage are cone tinklers (Plate 13). One is made of very thin cuprous sheet metal (probably sheet brass). Crushed flat, it is about 1 1/2 inches long. The other is ferrous. Long and slender compared to the brass tinkler, it is 3 3/4 inches long. Badly rusted now, the specimen was originally tinned or painted silver. De Vore and Hunt (1993:13) describe sheet brass and tinned iron cone tinklers recovered from Fort Union, ND. The former are about 1 3/4 inches long. The latter range from .62 to 2.76 inches in length.

The homemade finger ring is carved from a Novelty Rubber Company hard rubber button (Figure 4.6a; Plate 9, top right). The backmark, which encircles the perimeter of the button, was not cut away. It reads N. R. Co. GOODYEAR'S PAT. MAY 6, 1851. The obverse is also marked, but the marking has been partially cut away. Nonetheless, it appears that the mark reads something on the order of H O M & EY Co (or EX or EV; or FY, FX or FV).

The obverse mark is probably a clothing merchant or manufacturer. In fact the button was manufactured by The Novelty Rubber Co. Organized in New Brunswick, NJ., the company lasted from 1855 to 1870 (Herskovitz 1978:132; Luscomb 1967:140), dating this specimen (button manufacturing date) to a 15 year period. Reference is also to Charles Goodyear's 1851 patent, which improved the vulcanization process in the manufacture of hard rubber.

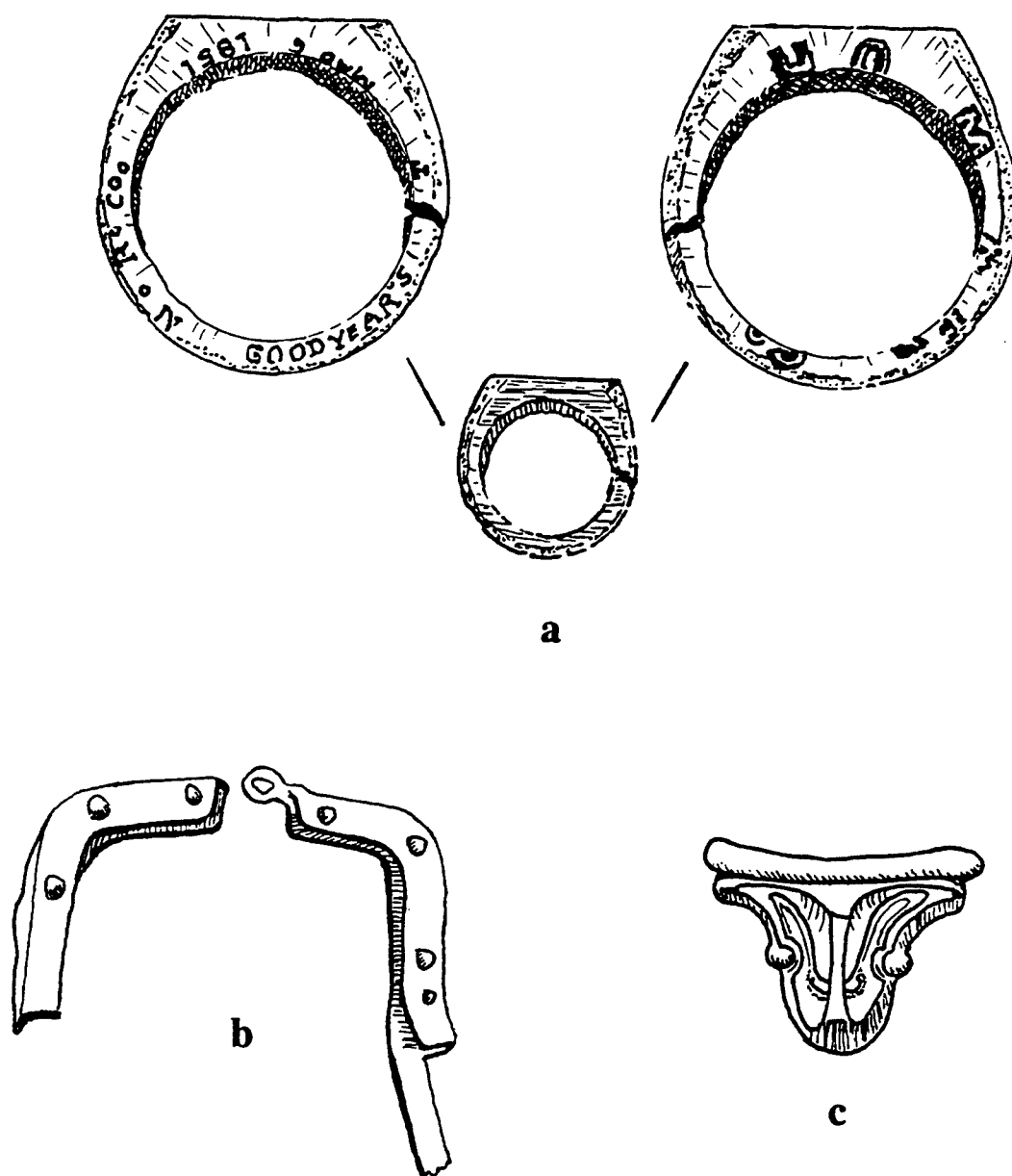


Figure 4.6. a) ring improvised from a Novelty Rubber Co. hard rubber button (actual size and 3x actual); b) coin purse frame, brass; c) fancy pewter leg from a bowl or urn. Items b-c are actual sizes. Ft. Ellsworth (14EW26), Locality 6.

Making rings from hard rubber buttons was apparently a popular pastime in the 19th century military. Kapler (1994:93) reports finding a similar ring at Fort Sisseton (1864-1889), a western frontier post. Soldiers during the Civil War idled away time by making rings as well. Lord (1995:27,28) describes and illustrates rings (and other items) that Civil War soldiers made from bone and wood. John Morrill while stationed at Fort Ellsworth wrote to his wife in an October 16, 1865 letter, describing a ring he had made from an "old black button" (Baer 1996:55). Probably Morrill used a hard rubber button.

The wedding or engagement band is made from 14 karat gold. The ring is fractured, but still intact, and it is a size seven. The mark 14k is imprinted on the inside of the band, but it is otherwise unmarked.

A thin, light (1.3 grams) ferrous disk is believed to be a small concha (Plate 12, bottom right). The flattened disk (5/16 inch diameter) was originally tinned gold (traces remain). A narrow raised ridge encircles the perimeter. The center area is raised, and in the center of the circular raised area is a tiny hole. Between the raised center and perimeter ridge are traces of an unintelligible design (or printing).

Coins

The two U.S. coins are both pennies. One is an "Indian head" penny dated 1865. The obverse is shown in Plate 30. The other is a badly disfigured Lincoln Memorial cent dated and minted '1968 D'. This coin was made at the Denver mint.

Coin Purse Frame

Two parts from a coin purse frame, or something similar, are illustrated in Figure 4.6b and Plate 9 (top right). The specimens are ferrous. They do not appear to refit, but one fragment retains a portion of one side of the snap lock. The top edge of a small cloth or leather bag fit into the frame and was riveted in place. There is no trace of the cloth, but three rivets are present on each specimen.

Tobacco-Related Items

Other than the lid to a Copenhagen can (Containers: Tin Cans), only smoking pipes are represented at the Fort Ellsworth site. Tin tobacco tags are absent. Their absence may or may not be a product of areas excavated, but it is interesting to note that they should be absent at pre-1870 sites. Tobacco companies began using tin tags about 1870, and they continued in use for some 70 years (Campbell 1964:101-104). The pronged devices were pressed into tobacco plugs to identify brands much the same as do cigar bands. The practice is credited to Pierre Lorillard (Schild 972:9).

SMOKING PIPES

Tobacco, chewing and smoking, was available from the Fort Ellsworth sutler (Baer 1996:52, 53). Smoking pipes from the site are represented by sherds, none of which is marked or decorated. Seven of the eight sherds are from white ball clay pipes (after De Vore and Hunt 1993:28), often called kaolin. The other sherd is from a buff-colored clay. Two are stem sherds (one shown in Plate 31), and six are from the bowl. Five bowl sherds (one shown in Plate 31) appear to be from the same bowl, which was fluted, or faceted. The buff-colored sherd, from a plain-bowl elbow pipe, retains part of the bowl and all of the shank (Plate 31), into which was probably fitted a straight reed stem. It exhibits evidence of use (black staining). The earliest clay pipes date from ca. 1580 (De Vore and Hunt 1993:28). Clay pipestems can be useful temporal indicators, but not for most of the 19th century.

Grooming Items

Grooming items include a brush handle, a bobby pin, and mirror sherds. The 4 1/4 inch long brush handle (Plate 32), probably a hair brush, is fractured at the first row of bristles. To fit the hand, the handle is slightly curved in side-view, and beveled in top-view. These features tend to rule out a toothbrush. A six-point star is incised on the handle, and inside the star is the letter 'L' (Plate 33). This monogram has not been identified. The incising is very irregular, suggesting either a poorly made manufacturing die, or that the owner incised it. The material is unknown, but it could be plastic. In any case, the Fort Ellsworth sutler did sell hair brushes (Baer 1996:52).

The ferrous bobby pin is complete, is 2 1/2 inches long, and is made of .060 inch round stock. The tension arm seems to lack grips. If once japanned black, no evidence remains. Mirror fragments are two flat glass sherds which are backed with an off-white substance, probably paint. The two sherds are from the same mirror, which was square or rectangular in shape (one of the sherds is from the corner of the mirror).

Eating and Cooking Items

Personal eating and cooking gear at a pre-1872 Army installation may not reflect a military occupation, this because the Army did not then issue personal mess gear to enlisted men, who had to purchase their own through commercial outlets - at nearby settlements, from itinerant merchants, from the post sutler. In fact, the sutler at Fort Ellsworth offered table knives and forks for sale by the set, as well as spoons (Baer 1996:52, 53). McChristian (1995:98) surmises that military officials felt soldiers would take better care of out-of-pocket personal gear, noting wryly that the policy saved the Army considerable money.]

In any case, and though some items might be identical to standardized equipment issued later, standardization in personal mess gear should be absent at pre-1872 military posts. This seems to be the case for Fort Ellsworth, assuming flatware and hollowwares in the assemblage belonged largely or exclusively to soldiers.

FLATWARE

Knives, forks and spoons are represented (Plates 14 and 15). None of the knives ($n=6$), all of which are ferrous, is complete. The broad, untapered blades are of various widths, tangs differ, and handles are of four different styles.

One specimen is a $7/8$ inch wide blade fragment broken about four inches from the tip. Another partial blade is also $7/8$ inch wide. The fracture is near the tang, which is present, as is part of the rod onto which a wooden (or bone) handle was pressed. Another specimen exhibits a one inch wide blade, also fractured near the tang, which is present, as is the entire metal handle. The tang and part of the blade are present on another knife, but the handle is missing. This specimen is badly oxidized, making it meaningless to measure blade width.

Two knives are nearly complete. Blade width on both of these is $15/16$ inch, and tangs on both are similar. One exhibits a ferrous handle, part of which is broken away. Originally probably a nine-inch knife, the specimen is now $7\ 5/8$ inches long. The other knife (Plate 14) once had a two-piece wood (?) handle riveted to the metal. Now eight inches long, it too was likely a nine-inch knife.

Only two of the seven spoons are complete. One complete specimen, now completely flattened, is a copper spoon with a fiddle-shaped handle. This specimen is six inches long. The other, a spatulate-handle tablespoon pressed from ferrous stock, is shown in Plate 14. This specimen is $7\ 1/2$ inches long; maximum dimensions of the bowl are $2\ 3/4$ inches and $1\ 11/16$ inches. Pressing created a ridge down the handle on the upside, and a corresponding channel down the underside. An identical spatulate-shaped handle (bowl is missing), is present in the assemblage. Interestingly, at the end which attached to the bowl there is a rivet hole, which likely would not have been an original attribute. Perhaps the handle broke, and the spoon was repaired by riveting it to the bowl.

Two other spatulate-shaped but broken spoon handles (bowls are missing) are similarly pressed (ridge and channel). The flares at their widest are $23/32$ inch on one, and $15/16$ inch on the other. These too are ferrous. The one with the wider handle exhibits traces of tinning.

Also representing spoons are two bowls (handles absent), both ferrous. Maximum dimensions of one bowl, now badly oxidized, are $2\ 1/8$ inches and $1\ 1/2$ inches. The other is larger, measuring $2\ 3/4$ inches by $1\ 5/8$ inches.

The three forks differ only slightly in morphology, but more so in details. All three are ferrous, and each is a 3-tine fork. One is complete (Plate 15, center), except for the wood, some of which remains on both sides of the handle. Three cuprous rivets held the two-piece wood handle on. This specimen is $7\ 3/8$ inches long.

Another fork (Plate 15, bottom) at $6\ 1/2$ inches is much shorter (handle length is $2\ 3/4$ inches). The two-piece handle (wood?), which was fastened by two cuprous pins, is absent, but one of the pins remains. The tip of the center tine is broken away. Most of an outside tine is

missing on the third fork (Plate 15, top). It too had a two-piece handle of wood (fragments remain) which was secured by three iron rivets that now project from both sides. This specimen is 7 1/2 inches long.

Variety in utensils notwithstanding, Fort Ellsworth knives, forks and spoons somewhat reflect private-purchase preferences of pre-1872 Army enlisted personnel. According to McChristian (1995:101) they preferred 3-tine forks about seven inches long, knives about nine inches in length, 7 1/4 to 7 1/2 inch spatulate- and fiddle-shaped spoons, and iron knives and forks with plain, two-piece wooden handles.

An exception to the two-piece wood handle preference is found in the Fort Ellsworth utensil assemblage. The specimen is one piece of a two-piece bone handle. Two cuprous rivets remain in the handle (.19 inch thick), which is 2 15/16 inches long. Both sides of the bone taper uniformly from a maximum width of 3/4 inch to a minimum of 1/2 inch. The uniform taper characteristic is congruent with fork handles. Both edges of the handle's upside are slightly beveled along its entire length.

IRON HOLLOWWARE

Hollowwares described here are all metal items that easily could have been used by military personnel. They are most commonly represented by the distinctive handles (n=5) typically found on cups, pots and meat cans used by third quarter-19th century Army personnel. McChristian (1995:99-101, 214) and Lord (1995:167-170) depict various of these items.

Plate 16 shows three complete handles. One is large enough for use on a coffee pot or meat can. Nearly in its original curvilinear shape, it is 6 3/8 inches long. Another complete handle (not shown) is bent slightly, and is now 6 1/2 inches long. The other two illustrated are about four inches long; they may have fit a cup. All were attached to the container by solder. Two other are from handles which, although broken and deformed, display the telltale folded edges.

Pots, pans, plates, cups and other non-issue mess gear could be purchased from the post sutler's store, or other retail outlets. One popular purchase was small ferrous pails or pots, used regularly for boiling and heating, and popularly called "muckets". The mucket from Fort Ellsworth (Plate 17, bottom left), part of which is missing, is now badly crushed, and in three pieces. Originally it was about 4 1/2 inches in diameter, and perhaps three to four inches-high. The bottom seam is lapped and soldered. The rim is rolled over a wire, which reinforced the open end and helped anchor the two bail ears, which are present and riveted (two iron rivets each) in place. A bail fragment is attached to one ear. Another bail fragment is loose. The reinforcement and bail are about 12 gauge ferrous wire.

Lord (1995:167) pictures a similar specimen (bail ears are identical), except it has a folded-edge handle like those described above. He calls it a coffee pot. If the Fort Ellsworth specimen had a handle, it is missing, and crushing has obliterated any such evidence.

Strainers are also present. One is clearly handmade from a large corrugated-body can which retains traces of gold tinning. The specimen, with lapped side seam, is six inches in diameter, and 6 3/4 inches high. One can end has been removed. The other (also corrugated and lapped) is randomly punched with holes, maybe using a cut nail (this is hard to determine). An interesting feature is embossing on the hole-punched end. Located in the center, on three separate lines, one above the other, is EW4/TFC/624. Attempts to trace this mark have not yet been successful.

The other strainer is probably factory-made (Plate 17, bottom right). Slightly deteriorated, it features a uniform, modestly outward flared rim. The hole pattern seems uniform and regularly punched. Diameter of the strainer is 3 3/4 inches; height is 1 1/2 inches. The side seam and (bottom) end seam are lapped and soldered. This specimen is similar to a strainer (or sieve) used in a stove-top drip coffee pot.

Two pieces refit to form most of a large, eighth-inch thick cast iron roast/bake pan. The rectangular pan has circular ends. A 1 1/4 inch wide lip surrounds the pan well. The well is 1 7/8 inches deep, and 19 1/4 inches by 8 1/4 inches at its longest and widest. Overall dimensions of the pan are 21 3/4 inches by 10 13/16 inches. The lip's upper surface has a lightly scored line parallel to and 3/16 inch from the outer edge. The size of this item suggests that it was used more in a communal food preparation context than any personal or family kitchen.

There is no evidence for a lug on the roast/bake pan, but another presumably large iron pot or pan had one, which is now broken away. The lug is made of 3/8 inch square stock shaped in a roughly circular fashion with an outside diameter of 1 3/8 inches. The specimen weighs 32.6 grams. There is no evidence in the assemblage for the container from which this lug came.

OTHER HOLLOWWARE

The one specimen described here suggests a fancy pewter bowl, urn or something similar. It is an ornamental pewter leg that, with two or three others, once supported a container. The specimen, which weighs 10.9 grams, is shown in Plate 4 (top right) and Figure 4.6c. It is an inch high, and 1 3/8 inches wide. Thickness varies from .09 inch to .15 inch. No trace of the container turned up in excavations.

Folding Knives

Levine (1993:137) defines standard jack knives as single-ended; the blade or blades is/are hinged at one end. The four Fort Ellsworth specimens, depicted in Plate 18, are standard jack knives. Styles include a premium jack and a boy's knife. The style of one knife has not been identified; the fourth specimen is principally a blade. All four are or were two-bladed jacks. Baer (1996:52) shows that the sutler at Fort Ellsworth sold "pocket knives", but does not indicate types or styles.

The equal-end premium jack is complete, in good condition, and replete with bone handles. The knife's shield is diamond-shaped. Incised within is the monogram DE. An arrow

runs horizontally through the monogram, with the arrow's "feathers" and "point" on either side of the letters.

The monogram represents "Diamond Edge", a trademark of Shapleigh Hardware Company, St. Louis, and subsequently the Imperial Knife Company (Imperial later merged with other companies). Stewart and Ritchie (1986:299) note that the Shapleigh monogram also included "Shapleigh Hdw. Co., St. Louis, Mo" around the diamond edge. If the Fort Ellsworth specimen had this, oxidization has obliterated it.

A.F. Shapleigh established the Shapleigh Hardware Co. either in 1843 (Price 1996:431), or in 1863 (Stewart and Ritchie 1986:298). The company's best known trademark was "Diamond Edge" (Price 1996:431; Stewart and Ritchie 1986:298). Various knife companies produced the Diamond Edge knife per Shapleigh's specifications (Stewart and Ritchie 1986:298-299). When in 1960 Shapleigh Hardware went out of business, Imperial Knife Co. acquired the Diamond Edge trademark (Price 1996:431; Levine 1993:103). (Stewart and Ritchie [1986:299] state that Shapleigh in 1960 sold its stock to Val Test Distributors of Chicago). Imperial Knife was still in business as late as 1993, and possibly 1997 (Levine 1997:124).

Price (1996:431) states that Shapleigh Hardware began its Diamond Edge brand in 1864 (which better fits Stewart's and Ritchie's date for the beginning of the company), and used it until 1960. Levine (1993:66), on the other hand, dates the Diamond Edge trademark to after 1888. According to Price (1996:431), the trademark is now used by Imperial. (Stewart and Ritchie [1986:299] state that Imperial made a "pocketknife with ... D.E. stamped on the shield in 1966.").

The premium jack style, however, apparently was not introduced until the 1890s. The equal-end variation evidently dates principally from the 1890s to about 1910. Almost all premium jacks made after 1910 are, according to Levine (1993:155), slightly tapered at one end. If Levine is correct, this knife may either date between the 1890s and ca. 1910, or it may be a post-1910 exception to the tapered end variation. The latter seems more likely given the knife's reasonably good condition.

The boy's jack - the handles are absent and the pen blade is broken - is incomplete. Earliest mass-produced boy's knives date to the 1850s and 1860s, and they are currently produced (Levine 1993:178). Maybe the handles were marked, but without them identifying this specimen further is hard.

The stylistically unidentified jack knife is also incomplete. The specimen appears to have had a blade (closed) and a punch (open). The blade is snapped, and the punch has deteriorated. The handles are absent. If this knife had bolsters, they too are missing. Overall shape is similar to a regular or curved regular jack, but the stepped bolster lining (cuprous) sets it apart. The bolster lining probably was designed this way partly to permit easy access to the blades' nail marks. Presumably the handles were shaped accordingly.

The final specimen is a complete blade (half open) with two bolsters, an end rivet, a very small fragment of a second blade (identifying it as a standard jack), small portions of both bolster linings, and part of the center scale. If the blade was marked, rust has obliterated any trace.

Hunting Knife

The hunting knife found at Fort Ellsworth is depicted in Plate 19. The knife's original length was substantial; even with a broken blade the specimen is 10 1/4 inches long. Wood remnants on the handle reveal the type of grip this knife had. The knife is largely ferrous; only the pommel is cuprous. A distinguishing attribute is the guard, or guillon, which turns slightly down toward the blade.

The knife lacks a maker's mark, trademark, brand or other marks (or such are obliterated by oxidization). The guard on a hunting knife found in Civil War context (North Carolina) is down-turned (Crouch 1995:67), but it is otherwise dissimilar to the Fort Ellsworth specimen.

Ceramics

Household ceramics at Fort Ellsworth - with one exception all whiteware sherds - are few (n=48 sherds). The exception is a single red earthenware body sherd - similar to master ink bottle jars - which lacks distinguishing attributes.

Whiteware is an ironstone-type stoneware that has a long history in the United States. It was first produced in England and imported during the late 18th century. Most English sets featured underglaze transfer printing until the 1840s, when unprinted whiteware versions became popular (Wetherbee 1996:7-9). In 1872, East Liverpool, Ohio, potteries began whiteware production (Gates and Ormerod 1982:8). Acceptance of American ironstone as equal to English imports began in the early 1890s (Gates and Ormerod 1982:10). As the 19th century closed, the white ironstone market was mostly in toiletwares and hotel china (Wetherbee 1996:10).

Whiteware specimens from Fort Ellsworth include body sherds (n=26), rim (n=16) and base/footing (n=2) sherds, part of a what might be a coaster, a lug sherd, and a knob from a lid. A few rim and body sherds are split sherds. None of the sherds exhibits maker's marks or other print such as military unit, department or branch.

Most whiteware sherds are probably from plates, bowls, cups and/or saucers. The mushroom-shaped knob (1 3/4 inch diameter) is probably from a lid that fit a serving bowl (Plate 34). Faceted on the upper surface, it exhibits a small, rounded protuberance which extends from the top of the knob. The lug (about an inch and a half long) is probably also from a serving bowl (Plate 34). Molded into the lug is a floral design. This specimen is from a bluish whiteware (as is one rimsherd from a different unit/level). Original diameter of the coaster (Plate 34) was about three inches. It has a 3/8 inch high lip. This specimen could also be a lid that fit over a ceramic jar.

The two base/footing whiteware sherds (one shown in Plate 35) refit to form a complete ring 1 11/16 inches in diameter. They were found in the same unit/level as four decorated rimsherds, also whiteware. The rims, two of which refit, retain much of the body of a cup or bowl (Plate 35). The body had a fluted surface and exhibits a molded, but faintly executed, vine and fruit (or bud) design which encircled the cup just below the rim. Four plain whiteware body sherds were also found at this provenance, suggesting all 10 sherds (base/footing, rim, body) came from the same item.

The only other decorated sherd is a rim, probably from a cup, which exhibits a molded wheat pattern, also faintly executed. The design encircled the item just below the rim.

Containers: Tin Cans

Virtually every can or can part at the site that retains technological attributes exhibits evidence for lapped and soldered endseams and/or lapped side seams. In addition, those specimens which can be classified technologically are, with rare exception, hole-in-cap cans. Hole-in-cap cans were in production by 1820 (Rock 1984:100). This type of closure persisted until the 1920s, when sanitary cans (also called solderless cans, open-top cans), invented in 1898 and first produced in quantity by the Sanitary Can Company beginning in 1904, replaced them entirely (Busch 1981:98; Clark 1977:18; Rock 1984:105).

Although hole-in-cap technology persisted into the 20th century, nearly every can from Fort Ellsworth likely pre-dates the 1920s by several decades. This determination is based on the near absence of certain technological features. Tin can technology saw the introduction of the double lock side seams in 1888, and double lock endseams in 1897 (Rock 1984:101, 105) (Calvi [n.d.] says locked seams were introduced in 1890). The Fort Ellsworth tin can assemblage contains scant evidence for locked seams, and no evidence for sanitary cans. The vast preponderance of cans and can parts exhibit lapped and soldered side and/or end seams. This strongly suggests that cans at the site, most of them, were deposited sometime prior to 1888 and after 1820.

The several exceptions to this date range consist of a cone-top can, meager evidence for hole-in-top cans, a snuff can lid, and the locked seams. The crushed cone-top can apparently has locked endseams and a soldered side seam. The Continental Can Company trademarked cone-top cans and, evidently, first marketed them as beer cans in 1935 (Maxwell 1993:98). This specimen appears to be a "high profile" cone-top can (Maxwell 1993:99). There are no markings to indicate beer as the contents of this can; it could also have contained brake fluid, which once came in cone-tops.

Another 20th century specimen is part of a crushed, torn, hole-in-top can. It has lapped and soldered side and endseams. Hole-in-top cans (also known as vent-hole cans), introduced by Carnation, used can ends (with lapped seams) that lacked the cap, but which retained the pinhole. The pinhole served the same function as the pinhole in the hole-in-cap can. Hole-in-top cans were produced after 1900 (Rock 1984:101).

The 2.5 inch diameter snuff can lid is embossed (pressed from inside the lid). UNITED STATES TOBACCO CO. encircles the lid at the circumference. Centered in the lid is UST, the three letters superimposed on each other. The United States Tobacco Company (UST), which originally produced pipe tobacco, was formed about 1895. The company was acquired by Weyman-Bruton Tobacco, a snuff company and the producer of 'Copenhagen'. Weyman-Bruton changed its name to the United States Tobacco Co. in 1922 (Wright 1997). According to David Wright (1997), curator of the Museum of Tobacco, Art and History (Nashville, TN), this lid style was used by UST from 1977 to 1985, and is from a can of 'Copenhagen'.

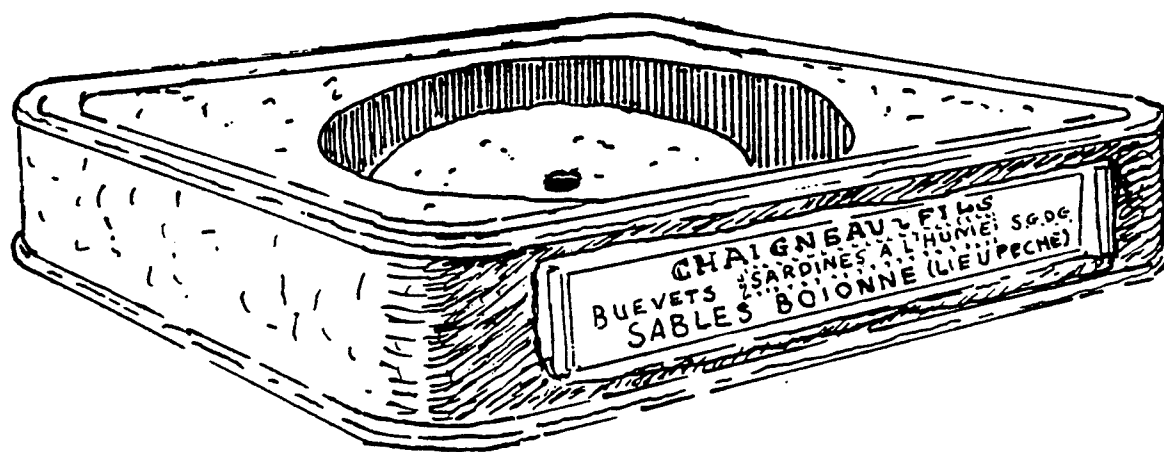
The locked seams mentioned above are on can fragments, probably from a single can which was about an inch high and perhaps seven inches in diameter. Both specimens are locked endseams, dating the can from which these seams came to after 1897.

Another candidate for a locked-seam can exhibits a congealed substance mixed with dirt. The odor hints at an oleoresin, maybe turpentine. Now in two pieces, the disfigured container is square - 4 1/2 inches on the sides - and six inches high. Bail ears are attached at opposite sides, but the bail is absent. The side seam is probably locked, but a definite identification cannot be made without cutting through the seam. End seams are lapped. The bottom, where the container was filled, is a hole-in-cap end. The can was tinned inside and out (traces remain); otherwise there are no markings. If the side seam identification is correct, this specimen dates after 1888.

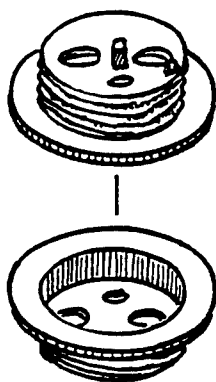
Other than the square can, the tobacco lid, the cone-top, and possible Carnation milk can, few cans or parts of cans yield clues regarding contents. One exception is a hole-in-cap sardine tin (4 5/16 inches long, 3 inches wide and 1 3/32 inches high) (Figure 4.7a; Plate 20). The cap remains, and the endseams are lapped and soldered (side seam characteristics are indeterminate). A sheet brass or foil label is attached to a side; it is embossed CHAIGNEAU ~ FILS/BUEVETS SARDINES A L'HUME S.G.D.G./SABLES BOIONNE (LIEU PECHE). Tiny circles set at tangent form a rectangular border around SARDINES A 'HUME.

The French reads "Chaigneau Sons/patented sardines in oil/fish caught at Boionne Sands". The meaning of "S.G.D.G." has not been determined, nor have particulars of this tin and product been traced. Technological attributes, however, show that the can probably dates prior to 1888.

Three other specimens are morphologically consistent (i.e., rectangular) with "sardine" tins, but they lack labels. Two are badly crushed. One crushed specimen exhibits lapped end and side seams, and is four inches long by 2 3/4 inches wide. The closure is indeterminate. The other (crushed) is a hole-in-top tin with lapped end and side seams. This specimen is about 4 1/4



a



b



c

Figure 4.7. a) Chaigneau Brothers sardine tin; b) unknown screw-on cap, brass; c) unknown brass object, PATD \PRIL ?.18??. Actual sizes. Ft. Ellsworth (14EW26), Locality 6.

inches long and 2 3/4 inches wide. The cap is about 1 1/2 inches in diameter. The hole-in-cap end has been partially opened and bent back. The third hole-in-cap "sardine" tin (lapped end, side seams) is four inches long, three inches wide and an inch high. On this tin, the cap is oval, not circular. One end has been partially opened (with a knife or pry opener) and bent back.

Other "sardine" tins are represented by rectangular can ends. One (a non-cap end) is 4 1/4 inches long and about 2 7/8 inches wide. Another specimen is a can end fragment from a "sardine" tin (probably the non-cap end). It exhibits evidence of a lapped, soldered endseam. An oval is impressed on the specimen. A third specimen is the hole-in-cap end fragment from a square or rectangular can (cap diameter is 1 5/8 inches). It was cut away from the tin with a knife or pry opener.

A number of can body fragments (n=21) have congealed contents (mixed with dirt) adhering to them. Parts of the contents are colored light to dark turquoise, others light yellow to tan. The contents were not analyzed, but paint is a good candidate. The 21 fragments include several seams, but the type could not be identified. All of the fragments were found in the same unit/level, indicating they are from the same can.

Otherwise, the 58 cans and partial cans in the inventory (some of which still exhibit tinning) lack hints of specific products. Most are cylindrical (n=53) (or were; all are disfigured). The remainder includes the four rectangular tins and the cone-top. Cylindrical cans on average are about four inches high and around three inches in diameter, a typical size for food cans. Overall, they exhibit various heights (those that can be measured). Heights range from a half inch high can (2 5/16 inches in diameter), through a "tuna" size can, to the larger cylindrical cans which range from 2 3/4 inches to about seven inches. The latter are most common in the four to 4.5 inch heights.

In fact, there is but one can over 4.5 inches in height - a seven inch (approximately) high specimen with lapped side and end seams (originally tinned gold). This can has corrugations around the body (like a coffee can), and on the remaining end (non-cap). A smaller lapped seam can (2 3/4 inches high), also tinned gold, has one corrugation near the top and one near the bottom. Its diameter is 2 1/4 inches. The larger can is crushed, but its diameter was probably from five to six inches. Otherwise, diameters range from 2 1/4 to four inches, with most falling in the three to 3.5 inch range (mainly the four to 4.5 inch high cans).

Can opening methods exhibited on some cylindrical cans, can ends, and can caps suggest canned foodstuffs at the site. The cylindrical cans indicate the most common way to open a can was to completely cut away the end with a pry opener or knife. This left a jagged edge on the can and can end. Several cans, however, exhibit a uniform cutaway edge on the end, indicating use of geared can openers. A few cans were opened by slicing the non-cap can end into four quadrants and then bending back the triangular-shaped quadrants. In several other instances, an end was partially cut away with an opener or knife and then bent back, creating a handle of sorts. These opening methods suggest bulky contents such as fruits and vegetables.

Some of the 29 (approximately) can caps (detached from hole-in-cap cans) exhibit portions of the can end, and these also exhibit opening techniques, mainly either a jagged (most common) or uniform edge.

Complete and partial can ends ($n \sim 75$; includes non-cap and cap ends, the latter with caps present or absent) exhibit opening attributes identical to those described for cans, including a folded back quadrant. In addition, several of the non-cap ends exhibit a small perforation, indicating some cans were opened simply by punching holes in them. Probably these contained liquids which could be poured through the opening.

Five of the can ends (non-cap) are complete or nearly so. Two complete ends (Plate 17, top right), one of which is folded nearly in half, are 1 1/2 inches in diameter. Both have a 1/8 inch lip, and one retains traces of tinning. The three other can ends retain parts of bodies. What remains of the bodies exhibit uniform edges just below (about a half inch) and parallel to the lapped end seam, as if the cans had been opened by removing a scored strip.

While can keys are absent from the inventory, there are a few ($n=12$) narrow (3/16 inch to 15/32 inch wide) sheet metal strips. The broken strips range from 3/4 inch to about two inches long. They were found with can parts, and may be strips from scored cans, but they are not coiled as might be expected if removed with a key. In any case, body and top scored cans were introduced in 1866 (Rock 1984:100).

Can ends with endseams or parts of endseams remaining are all lapped seams - none is locked. Many ends retain parts of the can body, and some of these exhibit portions of the sideseam. In these instances, sideseams are all lapped.

Other can fragments are seams pieces ($n \sim 26$) with no parts of ends remaining and little or no evidence for the can body. Included in this count are the two double lock seams mentioned above. Otherwise, all seam fragments, either sideseams or endseams, are lapped.

There are numerous fragments from can bodies ($n \sim 185$; some fragments listed under Sheet Metal could also be from cans). Many are simply non-descript pieces of sheet metal found with can bodies and ends (so some could be from ends). Others are bodies fragments with parts of ends and/or sideseams. In all instances, these seams are lapped. Two body fragments exhibit corrugated molding (cf. today's coffee cans) that once encircled the can.

Completing the can inventory are lids or fragments thereof ($n=7$). One - the tobacco can lid - has already been discussed. The remainder are ferrous save for a small fragment (1.8 grams) from a threaded zinc jar lid. The specimen otherwise lacks distinguishing attributes. except to say that zinc lids were evidently patented in 1858 (Patent No. 22,186) in conjunction with the canning jar (Toulouse 1969:429). Zinc "canning jar" lids, however, closed various glass containers into the 20th century, including, for example, French's mustard (see Spillman 1983:#134).

Other specimens are friction lids (Plate 17, top left and center), including a 1 3/8 inch diameter lid with a 1/8 inch wide lip. This specimen, pressed from a single sheet of metal, exhibits remnants of tinning on the underside.

Two friction lids are 3 1/2 inches in diameter. On one, a molded corrugation encircles the half inch wide lip halfway between the edge and lapped endseam. The other is a lid pressed from a single piece of sheet metal. It exhibits a 5/16 inch wide lip that is crimped along the edge. Another crimped edge can lid is 2 3/4 inches in diameter. The lip is a quarter inch wide, and it too is pressed from a single sheet. Finally, one friction lid fragment (10.3 grams) has a lightly corrugated edge. Friction lids suggest that canned dry goods were consumed at the site.

Containers: Glass

Unlike tin containers, glass containers, including complete bottles and sherds, reveal a variety of products. Some of these yield temporal information, either through embossing, decoration, manufacturing technique or style. Others yield both product and temporal data. This information suggests the glass container inventory is likely exclusively 19th century in age.

Containers that have been identified are C.H. Swain's Bourbon Bitters, Kelly's Old Cabin Bitters, Mexican Mustang Liniment, Davis' Vegetable Pain Killer, a Henry C. Kellogg product, a Garnhart and Kelly bottle, unbranded pickle bottles, an unbranded sauce bottle, barrel bottles, fluted bottles, and other bottles (ink, prescription or perfume).

Bitters

Embossed Kelly's Old Cabin Bitters sherds in amber and yellow-green suggest at least two bottles. There are numerous other unembossed "log cabin" sherds (molded logs, window and/or door panels, roof) in amber and yellow-green. These are either from Kelly's product or other unidentified brands of "log cabin" bitters.

Figures 4.8 and 4.9 illustrate some of the embossed Kelly's bitters sherds. These sherds probably came from a cabin bottle probably 9 1/8 inches high, and 2 5/8 inches by 3 3/8 inches, and that contained 26 ounces (cf. McKearin and Wilson 1978:308, 309). Freeman (1964:211) indicates the product also came in a 3/4 quart (approximately) bottle.

Kelly's Old Cabin Bitters was available from 1860 to 1880 (Schroy 1995:29) from depots in New York and St. Louis (Fike 1986:36). Indeed, Fike (1986:36) notes Kelly's Old Cabin advertising from 1864 and 1878. But Fort Ellsworth specimens may represent bottles manufactured between 1863 and 1870. Kelly patented his bitters in 1863, as the one sherd shows, so it, and doubtless the others, must date from 1863. Fike (1987:36) notes that the bottle design was patented March 22, 1870. Revi (1964:395) also mentions the design patent date, noting that John H. Garnhart of St. Louis secured the patent, and that the patented bottle contained Kelly's Old Cabin Bitters. After this, Kelly's bottles displayed the 1870 patent, so the *terminus ante quem* for the Fort Ellsworth sherds is probably 1870.

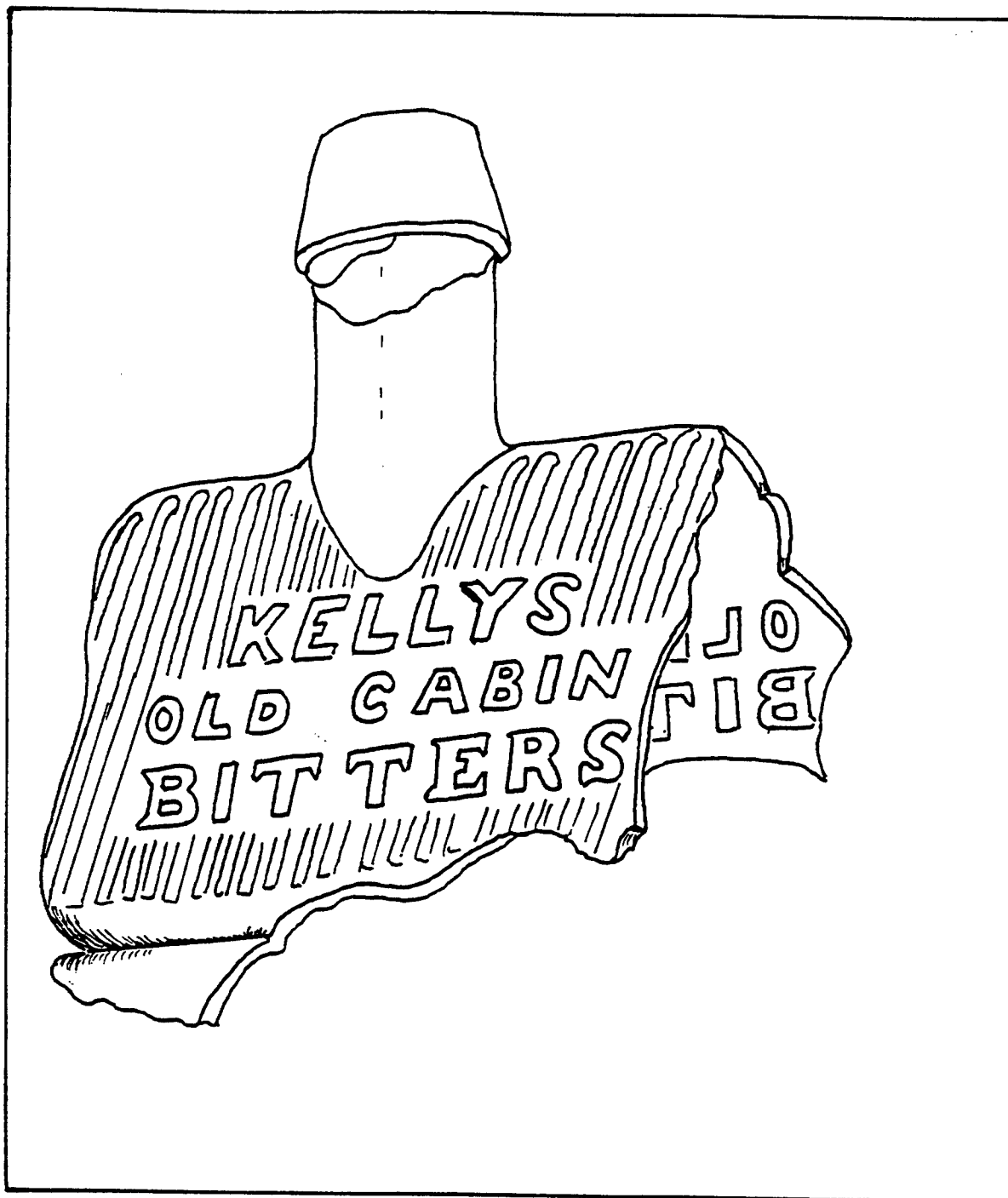


Figure 4.8. "Roof" and neck sherds from a Kelly's Old Cabin Bitters bottle, lime green. Actual size. Ft. Ellsworth (14EW26), Locality 6.

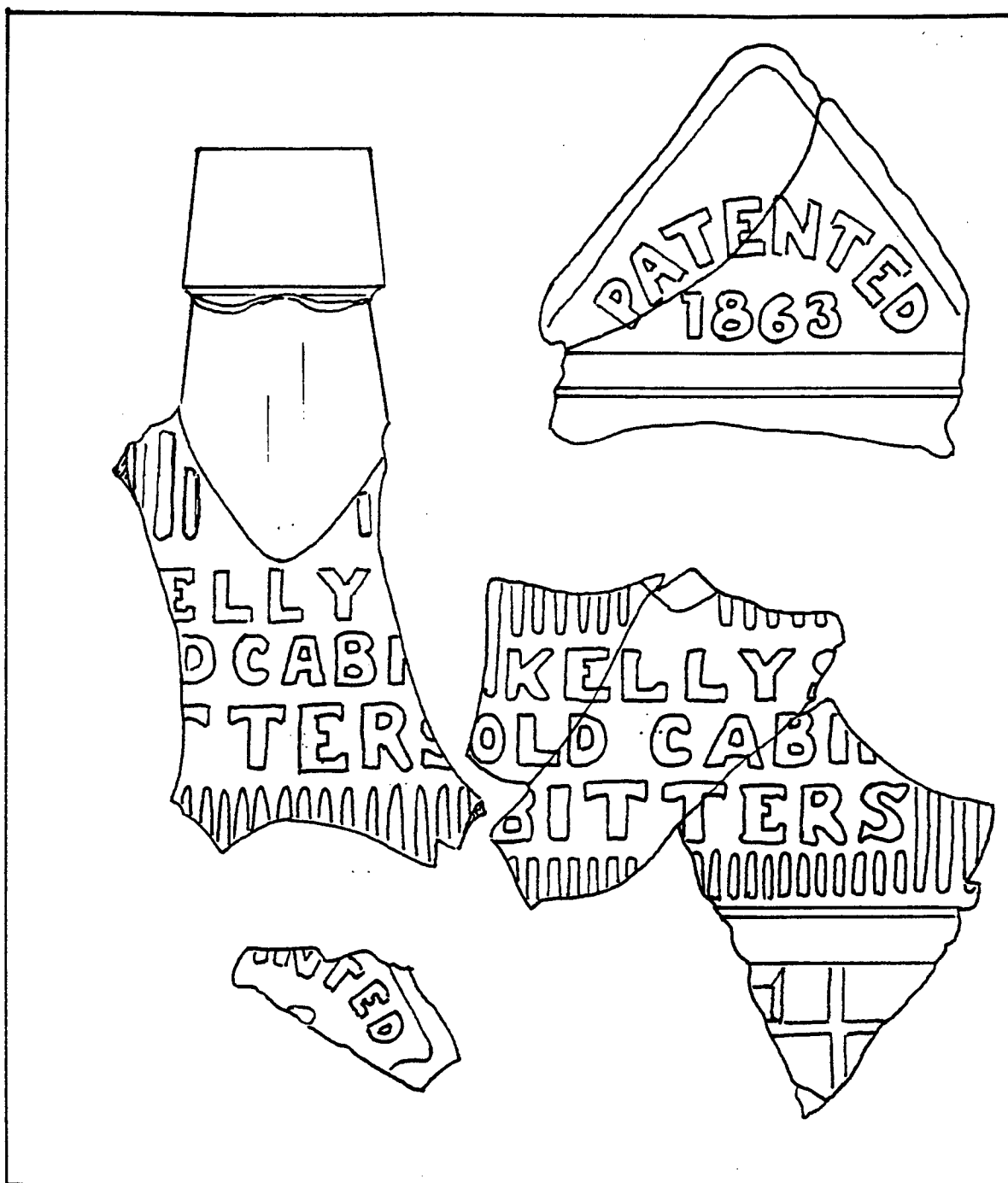


Figure 4.9. "Roof", neck and body sherds from a Kelly's Old Cabin Bitters bottle, amber. Actual sizes. Ft. Ellsworth (4EW26), Locality 6.

C.H. Swain's bitters is also represented at the site. Figure 4.10 and Plate 21 illustrate a complete Swain's bottle in amber; Figure 4.11 depicts six refit embossed sherds, all in yellow-green glass. These two specimens represent the two bottles types known to contain Swain's bitters (Ring 1980:448-449). Type 1 displayed the words 'bourbon' and 'bitters' on a single panel (i.e., BOURBON/BITTERS), as on the complete amber bottle. On Type 2 (e.g., the yellow-green sherds; Figure 4.11), the two words were embossed on two different panels (i.e., BOURBON//BITTERS).

A time period for these bottles has not yet been established, although they date at least to the mid-1860s. C.H. Swain was the proprietor of his company which was located at 34 South Water Street, Chicago (Ring 1980:448). A March 14, 1866 LaPorte Union (location unknown) newspaper advertised the product, as did a Keokuk, IA newspaper as follows. (Ring neither cites the LaPorte ad nor dates the Keokuk ad).

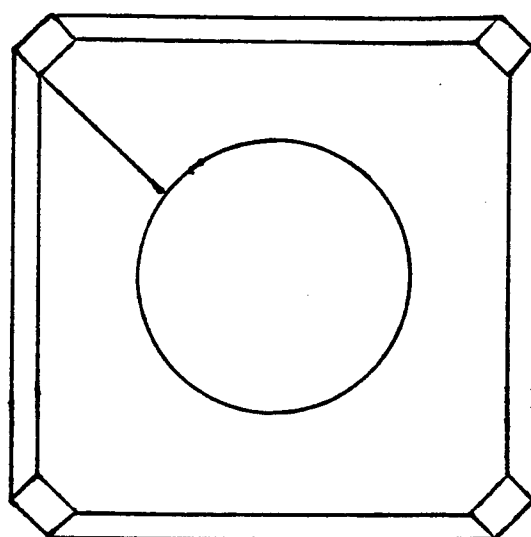
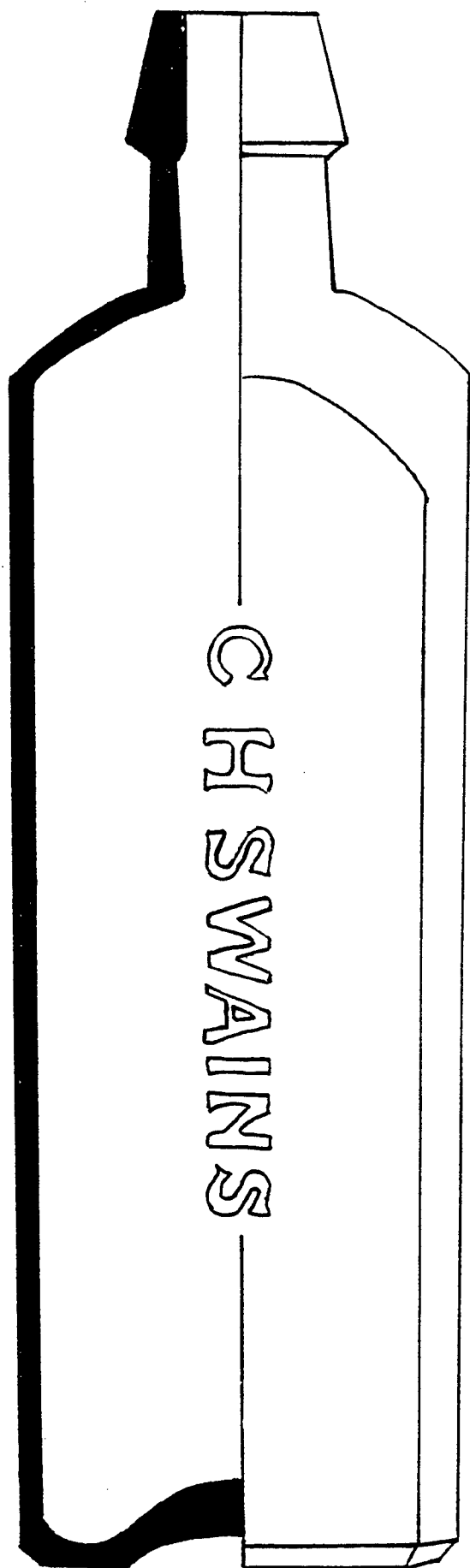
A healthy tonic, gentle stimulant and unequalled morning appetizer. Prepared in ripe old bourbon whiskey. Free from grain oil, with flowers, buds and barks of the highest medicinal value. By increasing the appetite, assisting digestion, regulating bowels, and giving tone to the system, they impart strength to the body and cheerfulness to the mind (Ring 1980:448-449)

Other amber sherds in the inventory are unembossed; they match in color the amber Swain's bottle. They likely represent an additional Swain's bottle (or bottles). Two amber neck/shoulder sherds are identical to the complete Swain bottle. As well, other unembossed yellow-green sherds are indistinguishable in color from those that are embossed. These sherds are likely from the same Swain bottle as that described here, or another.

Mexican Mustang Liniment

Eight aqua, embossed sherds are from a Mexican Mustang Liniment bottle. These liniment bottles were round; the words MEXICAN, MUSTANG and LINIMENT began at the shoulder, ran down the bottle, and ended at the base (see Wilson and Wilson 1971:59). Two sherds are embossed ME... and ...CA... (MEXICAN). Three other sherds refit and read MUSTAN... (only the first leg of the N is present). One sherd is embossed ...G (in MUSTANG); the letter is, as expected, at the junction of the body and base. Two sherds compete the embossing. One exhibits LI?... (LINIMENT) and the other displays a partial N (any one of the three words). Seven unembossed aqua body sherds found with the LI? and partial N are probably from the same bottle.

Fike (1987:135) and Wilson and Wilson (1971:59) note that Mexican Mustang Liniment was the product of George W. Westbrook, St. Louis. Fike (1987:135), however, reports that Westbrook introduced his liniment around 1825, while Wilson and Wilson (1971:59) date the product's inception to shortly after the Mexican war (ca. 1848). Probably the Wilson's are correct



B O V R B O N
B I T T E R S

Fig. 4.10. Type 1 C.H. Swain
bitters bottle, amber. Actual
size. Ft. Ellsworth (14EW26),
Locality 6.

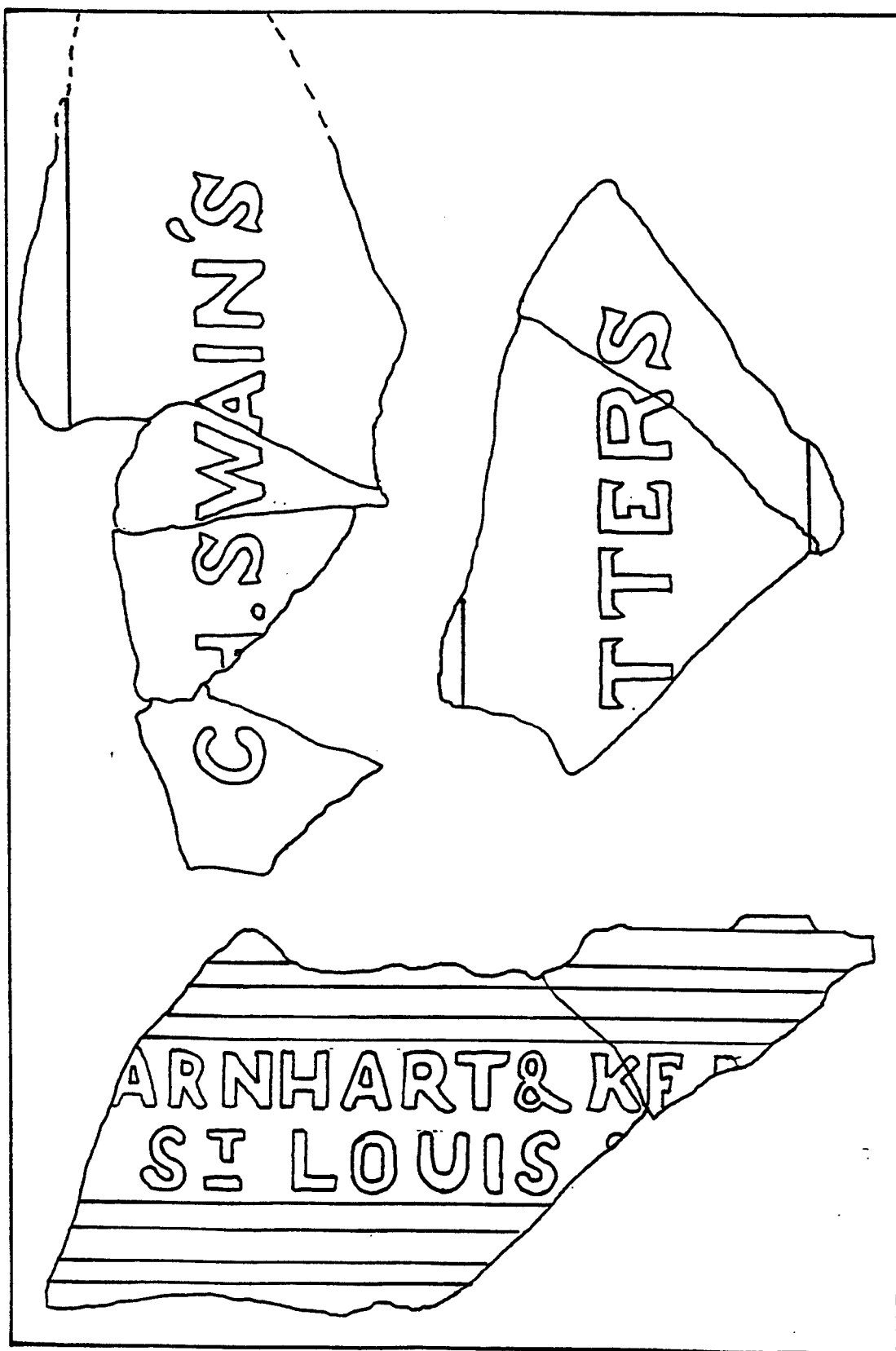


Figure 4.11. Above: C.H. Swain bitters bottle (Type 2) sherds, yellow-green; Below: Garnhart and Kelly bitters(?) bottle sherds, amber. Actual sizes. Ft. Ellsworth (14EW26), Locality 6.

because the first newspaper advertising for the liniment appeared about 1852 (Anonymous 1990:9).

Fike (1987:135-136) and Wilson and Wilson 1971:59) continue, noting that Westbrook moved to New York in 1856, where about 1860 he sold his business to Demas Barnes and John D. Park. Barnes bought out Park in the early 1860s. Sometime thereafter Barnes added D.S. BARNES/NEW YORK to the bottles. After 1871, Mexican Mustang Liniment was made by the Lyon Manufacturing Company (New York). Embossings added to these bottles (at an unspecified date) are LYON MFG CO/NEW YORK, LYON MF'G/NEW YORK or LYON MF'G CO. (see Fike 1987:69, 136, 143; Wilson and Wilson 1971:59).

The Lyon Manufacturing Company still sold the liniment as late as 1948 (Fike 1987:136). Sherds from the site, however, must date no later than the 1860s, since there is no hint of the Barnes or Lyon embossing on any of them. Thus it is likely that the specimens date somewhere between ca. 1850 and ca. 1869.

Mexican Mustang Liniment bottles came in three or four sizes (Baker and Harrison 1986:248; Baldwin 1973:341; Wilson and Wilson 1971:59). The sherds reported here probably came from one on the small sizes, perhaps the four inch (high) by 1 3/8 inch (diameter) bottle.

Davis' Painkiller

Four aqua sherds are embossed DAVIS°/VEGETABLE/PAINKILLER. The sherds refit to form nearly a complete panel bottle (minus neck, finish and part of the body). Perry Davis (1791-1862), a Taunton, MA shoemaker, devised his concoction about 1840 (Baker and Harrison [1986:246] say "in the 1830s"). Sometime before 1845, the year Davis registered his painkiller according to an Act of Congress, the company moved to Providence, RI. In 1863, after Perry died, son Edmund assumed control. Edmund died in 1880, at which time Davis and Lawrence, Co. of Montreal took over. This firm, known in the 20th century as Davis and Lawrence, Ltd., expanded into New York in or sometime before 1895. Rights in the West belonged to J.N. Harris and Co. Canada Packers, Ltd., purchased the company in 1967 (Baldwin 1973:144-145; Fike 1987:130-131; Hanson 1990:7-11; Herskovitz 1978:14; McKearin and Wilson 1978:298-299).

Fike (1987:131) reports that the painkiller was advertised as late as 1984. Baldwin (1973:144-145) says only that the product was "sold for more than 60 years" after its inception in 1840. McKearin and Wilson (1978:298-299) note that as late as 1958 the product, now under the label "Liniment (Painkiller Brand)", was still being purveyed. The change to "liniment" was apparently necessitated by passage of the 1906 Food and Drug Act (Fike 1987:131). An 1875 painkiller formula listed opium as an ingredient. Likely the opium caused the manufacturers to bill their product as an external rather than internal cure. The same formula also listed alcohol, camphor, pepper, myrrh, guaiac, spruce oil, and red saunders (Hanson 1990:11).

Wilson and Wilson (1971:31) found 23 varieties of Davis' painkiller bottles - in three sizes. They illustrate several bottles, including one from 1858, one dating around 1866, and one

attributed to ca. 1890. The specimen from the site is quite similar to the 1866 bottle, but unlike the ca. 1890 bottle and slightly different than the 1858 bottle - the DAVIS panel is shallower. The Fort Ellsworth specimen probably contained about two fluid ounces - 4 7/8 inches high, and 1 7/16 by 3/4 inches along the sides. What appears to be an identical bottle was found at Fort Union, NM. Wilson (1981:xi, 44) places that specimen between 1851 and 1890, the period Fort Union was in operation.

Garnhart and Kelly Bottle

Two refit amber sherds - from a paneled bottle - are embossed ...ARNHART & KE.../S^I LOUIS (M)... (Figure 4.11). The sherd is broken such that if a comma followed LOUIS, it is missing. Other unembossed amber sherds in the inventory are probably from the same bottle, or one like it. The embossing evidently ran from shoulder to base.

Wilson (1981:24) describes a square, amber bottle similarly, if not identically, that is embossed GARNHART & KELLY/S^I LOUIS, M^O. This bottle is paneled, columned and described as a "schnapps style". Unsure of the contents, Wilson concluded it contained about 20 ounces of either whiskey or bitters. The specimen came from Fort Union, NM (1851-1890), and is dated to the period 1863-1865, evidently by identifying the company that packaged the product (Wilson 1981:vii, 24). Undoubtedly the Fort Ellsworth sherds came from a bottle similar in style, age, and contents - spirits or bitters.

The Garnhart portion of the duo is probably John H. Garnhart, or a member of his family. In 1870, while living in St. Louis, he patented a log cabin bottle design used for Kelly's Old Cabin Bitters (Revi 1964:395). Very likely Garnhart's partner was the Kelly of Kelly's Old Cabin Bitters. In fact, Ring (1980:279) briefly attributes Kelly's bitters after 1870 to Garnhart and Kelly of St. Louis, MO.

Henry C. Kellogg Bottle

Seven light green sherds from a square (rectangular?) bottle, some of which refit, are embossed HENR(Y) C. KELLO(G).../PHILAD^A (two dots are under the legs of the small A; see Figure 4.12). Numerous other unembossed light green sherds are probably from this bottle, or one like it (see Other Embossed Sherds). Zumwalt (1980:260) notes that Henry C. Kellogg, Frank E. Ellwell and George H. Wyegant were partners in the Henry C. Kellogg Company. The first Philadelphia listing found by Zumwalt was 1862 - as produce commission merchants at the corner of Chestnut and Water streets. An 1873 advertisement describes the partners as commission merchants and agents for certain brands of soap and starch. The company evidently moved to 100 South Water Street in 1883. Henry C., Jr., began clerking in 1887. Zumwalt found no listing for the company in 1893.

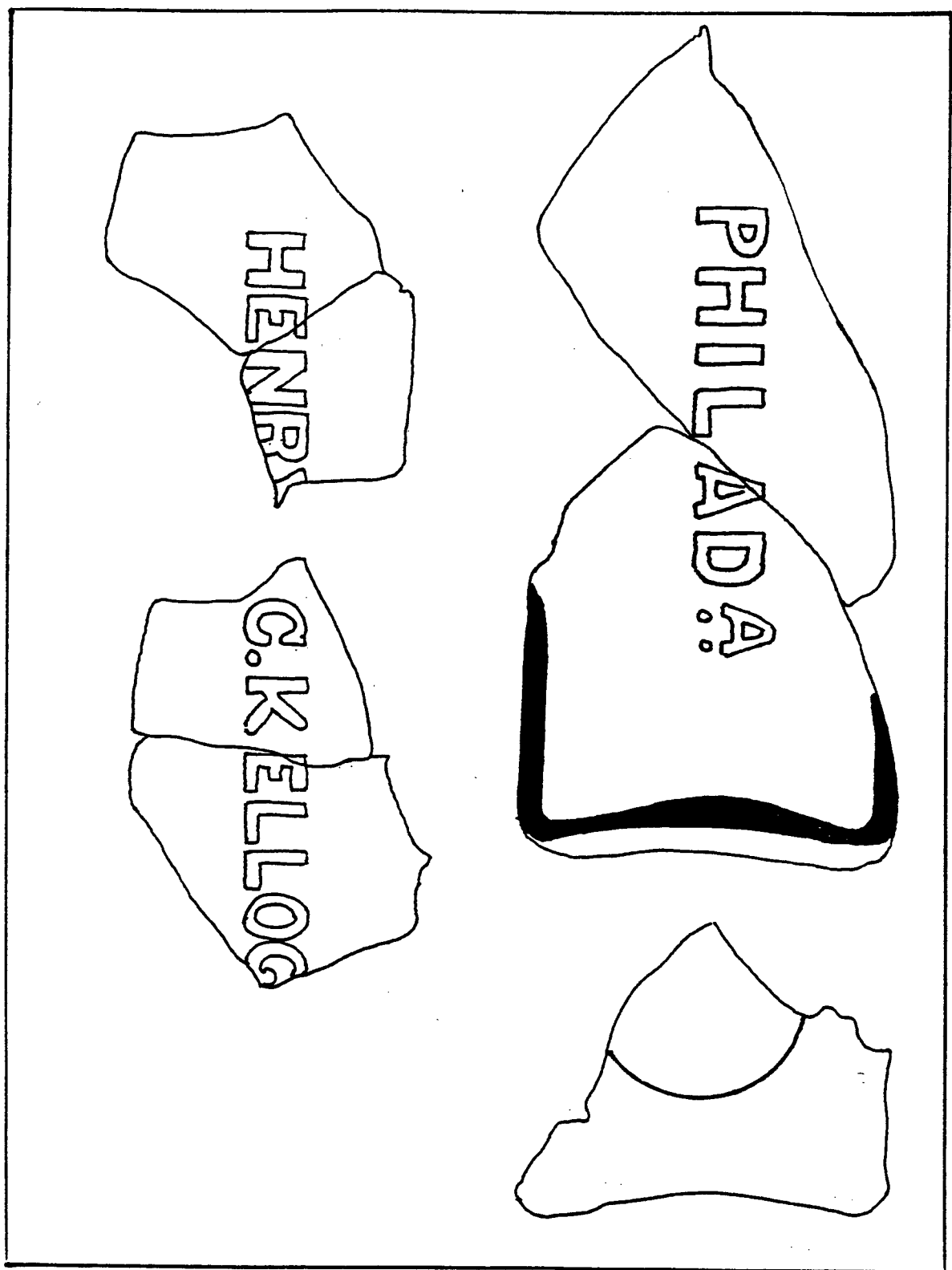


Figure 4.12. Henry C. Kellogg food bottle sherds, light green. Actual sizes. Ft. Ellsworth (14EW26), Locality 6.

Contents of the Fort Ellsworth bottle have not been identified (Zumwalt does not illustrate it, but the title of her book is **Ketchup, Pickles, Sauces**). As produce merchants, the partners might have bottled vegetables, fruits, pickles or the like. In any case, the bottle very likely dates somewhere in the 30-year period between 1862 and 1892.

"Peppersauce" Bottle

Figure 4.13 and Plate 21 illustrate an unembossed, cathedral-style (Gothic) "peppersauce" bottle (aqua) which likely dates to the last half of the 19th century. McKearin and Wilson (1978:274-275) illustrate and describe an identical bottle - generally called sauce or peppersauce, but the bottles were used also for ketchup, juices, syrups, essences and capers. The bottle has also been found at Fort Laramie, WY, and dated by Wilson (1981:88) to 1850-1890, the military period at the post. Sherds from this style bottle have been found at the Crowleytown Glass Works (NJ), which existed from 1851 to 1866 or 1867 (McKearin and Wilson 1978:136, 274). (Putnam [1968:88] says the Crowleytown Works began in 1850 to 1851; van Rensselaer 1969:133] says the last firing at the Crowleytown works was in 1866).

Six-sided bottles were also made in this style, one of which was found at an eastern Civil War site (Crouch 1995:26). The design on this bottle is precisely the same as that on the Fort Ellsworth specimen.

Zumwalt (1980:432) also illustrates a bottle identical to the Fort Ellsworth specimen, indicating that the bottle style was used by Wells, Miller and Provost for their peppersauce and essence of peppermint. The Wells, Miller and Provost label was affixed to at least one of the four large panels. Zumwalt (1980:428) continues, noting that in 1837, John B. Wells established a pickling business in New York City. Ebenezer Miller joined Wells in 1841, followed in 1844 by Stephen H. Provost, forming Wells, Miller and Provost. Evidently around 1853 Miller departed, but the company continued using the three names. By 1867, Provost owned the company, which came to an end in 1887.

Zumwalt (1980:432) states that this design was common. Whether or not glass works other than Crowleytown produced it is unknown, nor is it known if merchants other than Wells, Miller and Provost used this style. A similar "pepper sauce" bottle is illustrated in the 1880 Whitall, Tatum & Co. catalog. Shape is the same, but the upper two panels or "windows" are not filled with a design (Anonymous 1971:49). In any case, it seems the Fort Ellsworth specimen probably dates either from a time period as short as 1851-1867, or a longer period, 1844 to 1867 or 1887. A bottle in an identical style came from Fort Laramie (WY). Wilson (1981:88) dates that specimen to the period 1850 to 1890, approximately the period of time the post was under U.S. Army ownership.

Pickle Bottles

Hundreds of aqua and light green sherds - including base, body, shoulder, neck and finish - can be identified as glass from a single style (Gothic or Cathedral) of wide-mouth pickle bottle.

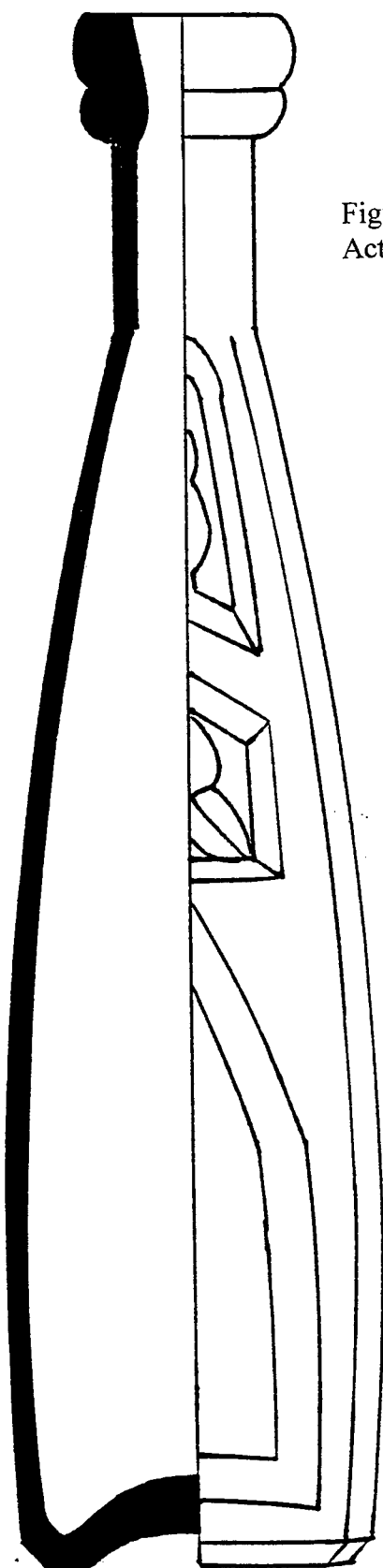
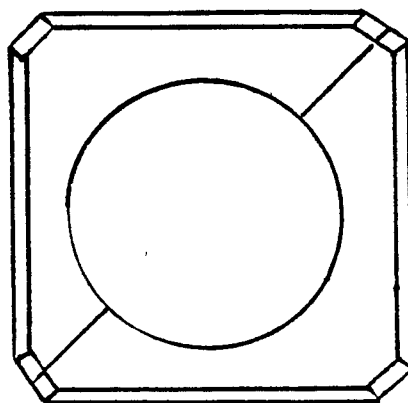


Figure 4.13. Gothic (cathedral) "peppersauce" bottle, aqua.
Actual size. Ft. Ellsworth (14EW26), Locality 6.



A representative sample is illustrated in Figure 4.14, which shows the sherds in relative positions on the bottle. McKearin and Wilson (1978:273) illustrate an identical bottle.

This highly ornate bottle contained two quarts and five ounces. Height was 13 7/8 inches, and the square bottle measured four inches on the sides (McKearin and Wilson 1978:272). The fact that the Fort Ellsworth specimens are found in light green and aqua suggests they were manufactured at the Crowleystown Glass Works (NJ) site, where sherds of the same two colors from an identical bottle style have been found (McKearin and Wilson 1978:272). The Crowleystown works was in operation from 1851 to 1866 or 1867 (McKearin and Wilson 1978:136, 274). Also, a bottle of identical style, but apparently smaller, was found at a Civil War site in Hilton Head, South Carolina (Lord 1995:58). Spillman (1983:#79) dates the various styles of cathedral bottles from ca. 1840 to 1880.

Barrel Bottles

Most if not all of 104 unembossed sherds are from barrel bottles. Glass colors vary - clear with yellow tint (n=22), light yellow (n=74), and yellow-green (n=8) - indicating the sherds are from various bottles. Most are body sherds, but there are two bases and four rimsherds. The two bases exhibit three molded, raised lines just above the base. One rimsherd exhibits the same molding just below the rim. The ridges encircled the bottle parallel to the rim and base. Most body sherds also exhibit raised ridges typical of the barrel style.

The 22 yellow tinted sherds are from one barrel bottle style (if not the same bottle). The style is similar, but not identical, to barrel bottles found at Fort Union, NM (1851-1890) (see Wilson 1981:88, #320), aboard the steamboat Bertrand (Switzer 1974:49), and in Zumwalt (1980:448, far left). The 22 sherds include a two inch diameter base, the four rimsherds, and 17 body sherds.

The other base is light yellow, and also two inches in diameter. Seventy-three body sherds of the same color are probably from the same bottle (they were found in the same excavation unit). The style appears to be the same as the one just described. Both were made from a two-piece mold.

Barrel bottles are usually associated with mustard, but they were used to pack various foodstuffs. McKearin and Wilson (1978:263) tentatively date the "mustard" barrel bottle to the third quarter of the 19th century (1850-1875). The temporal context at Fort Union in which barrel bottles were found is the ca. 40 year period the post was in existence, about 1850/51-1890 (Wilson 1981:xi, 88-89). As well, the Bertrand, carrying cargo to Montana Territory, sank in 1865 (Switzer 1971:1).

Fluted Bottles

Some clear, green and aqua sherds (n=57) are from cylindrical, fluted bottles. The total includes unfluted aqua specimens found in association with fluted sherds. The latter are



Figure 4.14. Sherds (3/4 actual sizes) from a Gothic or Cathedral style pickle jar perhaps manufactured by the Crowleytown Glass Works, NJ (1851-1866/67). Inset depicts intact Gothic pickle bottle - 13 7/8 high, 4 inches square; capacity 2 quarts, 4 ounces (from McKearin and Wilson 1978:273). Ft. Ellsworth (14EW26), Locality 6.

probably from the same aqua fluted bottle(s) represented by the fluted sherds (or identical bottles). Fluted bottles of this type typically contained ketchup. The absence of labeling or embossing precludes more detailed identification.

The total includes a complete base (2 9/16 inches diameter) with much of the lower body remaining, and two base fragments. On the complete specimen, flutes start at the base and continue to the broken edge. A smaller base sherd exhibits identical morphology. On another specimen - a shoulder/body sherd - fluting began at the shoulder and continued toward the finish. The rest are fluted (most) and unfluted body sherds.

Other Bottles

Other bottles are represented by an ink bottle and a complete prescription or perfume bottle (Plate 21). The small (14.4 grams), cylindrical, long-neck prescription or perfume bottle, made of clear glass, is 2 1/8 inches high and 7/8 inch in diameter. The bottle is unembossed and lacks decoration. It is made from a two-piece mold and has an applied finish. Mold lines stop short of the finish, indicating it is from the period 1860 to 1880.

An unembossed, non-paneled conical ink bottle (aqua) is also made from a two-piece mold. The finish and part of the neck has been broken off. The specimen now is two inches high; original height was probably about 2 1/4 inches. At the base the bottle is 1 7/8 inches in diameter. McKearin and Wilson (1978:261) state that conical ink bottles were first introduced in 1840. Covill (1971:19) is less precise, noting that conicals were used from the "early 1800's ... into the early years of the automatic bottle machine". The automatic bottle machine was patented in 1903. This specimen lacks a pontil mark, indicating it was made after 1857. Thus the bottle probably dates between 1858 and about 1903.

Other Glass

The glass assemblage also contains a few sherds with bits of embossing, too little and too incomplete to effect identification of product or maker. As well, there are a handful of sherds which suggest other ornate product bottles, and decorative glass. Decorative patterns can be described generally for a few, while others cannot due to incompleteness.

Also included in the glass assemblage are bottle necks, finishes, and bases not mentioned in the Containers: Bottles section. They too are described here.

Other Embossed Sherds

Embossed sherds that have not been identified are few. One is yellow-green with a portion of G or C. The square or rectangular bottle had slightly chamfered corners. The letter is next to the chamfer, indicating it was the last letter of the word (i.e., ...G).

Another sherd, aqua in color, exhibits portions of the lower three-quarters of an E, followed by the lower portions of two identical letters, either E or L, and finally the very bottom

of a cursive letter such as C, G, J, O, Q, S, or U. Most likely the last letter is an O, and the embossing is ...ELLO..., or KELLOGG. If so, this is likely from a Henry C. Kellogg bottle, perhaps the aqua Kellogg barrel bottle shown in Zumwalt (1980:260).

Two small, lime-green sherds from the sloping shoulder of a cylindrical bottle refit. The embossing on both reads ...RE SAU(C)... Likely these are from a food bottle which contained a sauce of some kind. Identification efforts based on these clues have as yet been unsuccessful. Glass color is very close to the Henry C. Kellogg bottle reported in a previous section, but sherds from that bottle are much thicker than these.

Two aqua sherds, apparently from the same bottle (they do not refit), are very thin. One has a recessed panel, suggesting a panel bottle. The other exhibits an unintelligible letter or letters.

Other Decorated Sherds

As mentioned, there are numerous decorated (molded) sherds from the aqua and light green pickle bottles. There is also a sherd from a cathedral-style sauce bottle of the type already described. Otherwise, decorated sherds are limited, highly fragmented, and largely ambiguous, except to say that most are probably from bottles. A few others are probably from decorative glasswares such as tumblers, glasses or bowls.

A single, small aqua sherd (6.4 grams) displays part of a poorly molded figure with arms outstretched and upright, perhaps a gnome or elf. The specimen has not been identified, including type (e.g., from a bottle, flask, glass).

Forty-four aqua sherds (square or panel bottle), all from the same excavation unit, exhibit a poorly molded vine-and-bud motif. Other unmarked sherds may be from the same bottle, or one like it. The design is otherwise unintelligible and has not been linked to a bottle maker or product.

The vine-and-bud mold is also present on light green body sherds. Most of the 48 sherds in this color (evidently all from the same bottle) have the design. The bottle was square, about two by two inches as the base shows. A small lip sherd suggests a widemouth bottle.

One clear specimen is a rimsherd or lid fragment from a molded decorative glass piece. Circles alternate with sets of three parallel lines to form a geometric design which ran vertically around the body. The top view exhibits diamonds in three dimension, these bordered by a reeded rim.

Several other specimens in clear and light green glass exhibit a molded ridge. On some, it is not clear if the ridges are part of a design, say from a barrel bottle, or if they are glass mold marks. In any case, the sherds are unidentifiable.

A dark amber sherd (13.8 grams), which may be part of a base, exhibits a trace of a ridge and valley design. Another tiny, aqua sherd (1.0 grams), appears to have an etched line across it. A sherd weighing .1 gram exhibits a pressed line. Two other sherds, one clear (.6 grams) and the other green (~1.3 grams), exhibit unintelligible molding, either a letter or design. Finally, a light green sherd (2.7 grams) exhibits a molded ridge.

Bottle Necks and Finishes

Described here are necks and finishes not already covered in previous glass sections. These specimens support several earlier identifications of products and bottles based on embossing and decoration, and they add to the list, at least tentatively. Wine and/or champagne bottles are probably represented, and perhaps a toiletry product of some kind, and maybe beer, ale or whiskey.

This section includes the various glass sherds with any combination of neck, neck elaboration, collar(s), finish and lip. A neck is defined as sherd with a substantial portion of the neck remaining, or all of it, as well as the collar(s), if any, the finish and the lip. A neck finish is defined as a sherd without any neck, or nearly so, but with collar(s), if any, plus finish and lip. Most necks exhibit mold marks that stop short of the finish, suggesting a temporal provenance between 1860 and 1880 (Figures 4.15 and 4.16).

Several sherds (Figure 4.15a-c) suggest small perfume and/or prescription bottles. The Figure 4.15a neck is virtually identical (tint is slightly different) to that on the small but complete bottle in Plate 21. Another neck (in aqua glass; not illustrated) is sized similar to that in Figure 4.15a, and looks the same except that the lip is not flared. Rather, the lip and neck are the same size. Figure 4.15c is representative of two Fort Ellsworth neck sherds, both in clear glass.

The specimen in Figure 4.15d, dark green in color, is probably from a wine or champagne bottle. Two other neck finish sherds are identical to that illustrated in Figure 4.15d. Based on Wilson's (1981:111) shape and finish key, two specimens (Figure 4.15e-f) are likely from champagne bottles. Both are green in color. Switzer (1974:24, 26) illustrates champagne bottles (from the steamer Bertrand) with a collar and finish identical to the one in Figure 4.15e. Switzer (1974:47) also shows a similarly finished ketchup bottle, but the specimens illustrated are far more massive. The Fort Ellsworth collection contains another specimen like Figure 4.15e (neck finish and neck), and two smaller sherds from the same neck finish.

The specimens illustrated in Figure 4.15g and Figure 4.16a, both in amber, may be from beer, ale or whiskey bottles - as suggested by glass color, neck finish, and neck shape. Switzer (1974:16-21, 31-32) in his Ale, Beer and Stout, and his Wine, Whiskey and Bitters sections illustrates similar styles, as does Wilson (1981:4-6) in his Beer section. In addition, the Fort

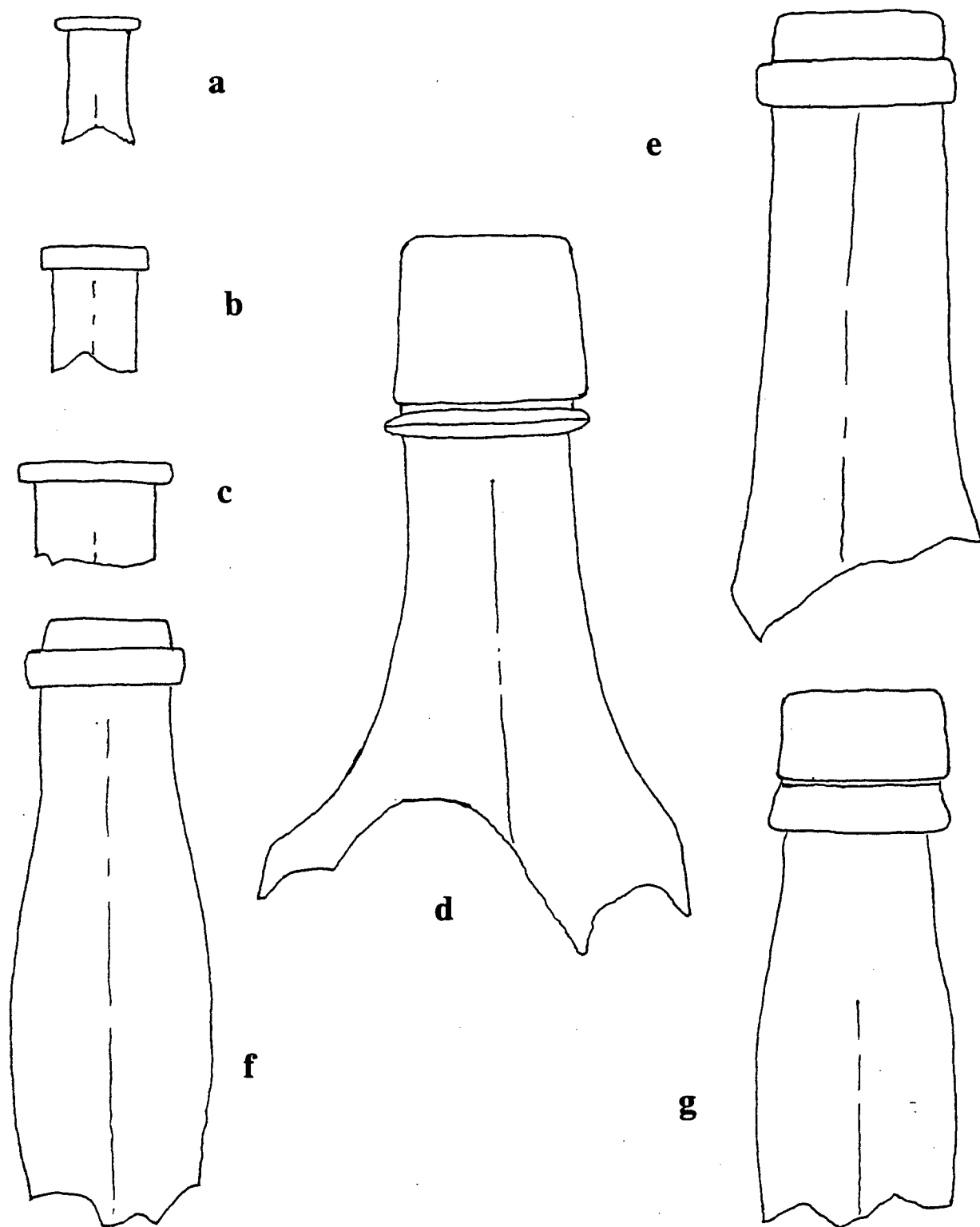


Figure 4.15. Neck shapes: a) clear, yellow tint; b-c) aqua; d-e) light green; f) green; g) amber. Actual sizes. Ft. Ellsworth (14EW26), Locality 6.

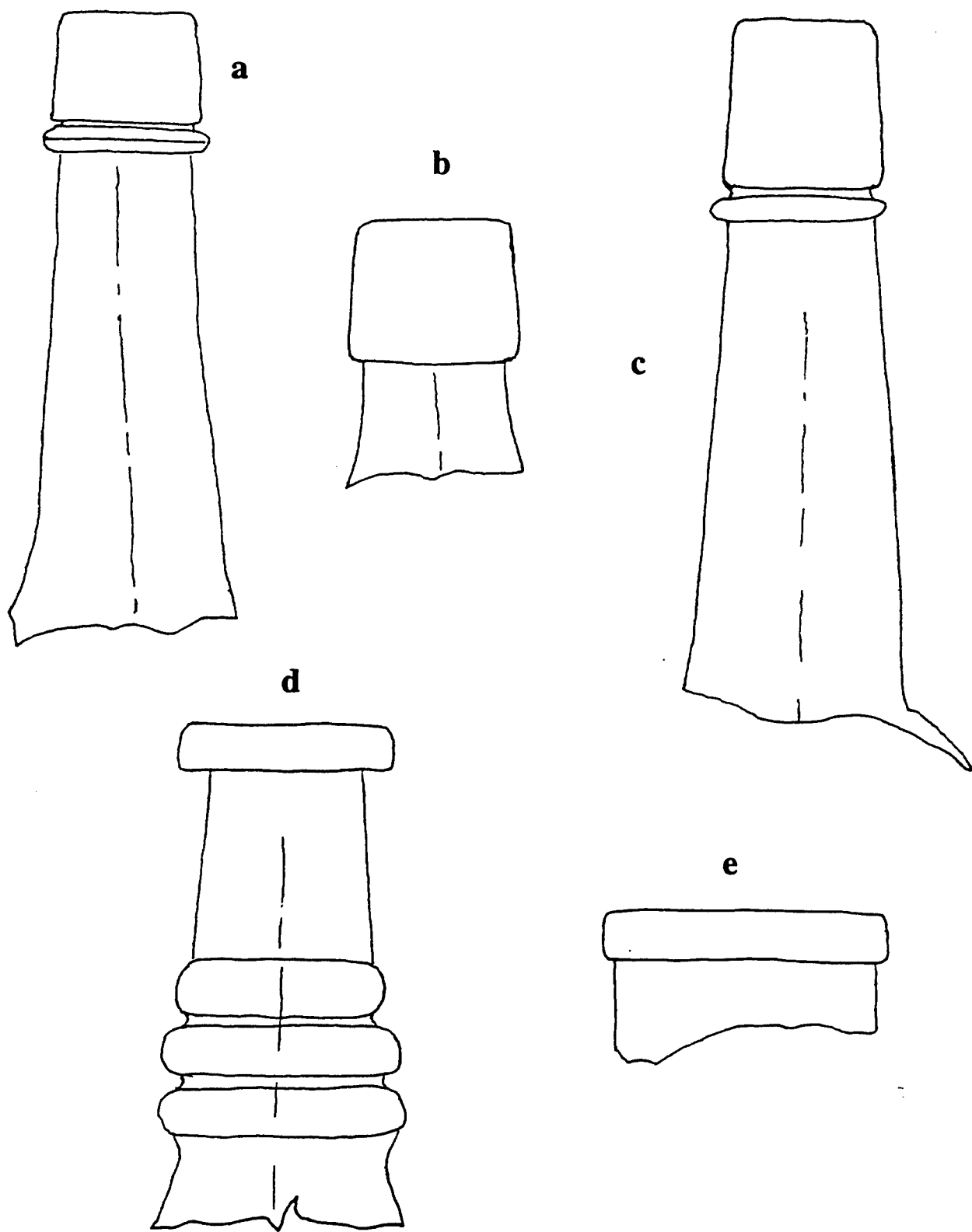


Figure 4.16. Neck shapes: a-b) amber; c) clear, light purple tint; d) aqua; e) light green. Actual sizes. Ft. Ellsworth (14EW26), Locality 6.

Ellsworth assemblage contains four small neck finish sherds identical to that on the neck depicted in Figure 4.16a.

Wilson (1981:111) attributes the style illustrated in Figure 4.16b to an oil bottle (e.g., salad, olive). Morphologically and in color the sherd illustrated is identical to the neck finish on the amber C.H. Swain bitters bottle, but it is wider (from bottom of finish to lip). Kelly's Old Cabin Bitters bottles also exhibits a similar neck finish. Probably a good bet is that this is from a bitters bottle of some kind.

Another neck is clear with a faint purple tint (Figure 4.16c). Tinting may be the result of exposure to the sun. Though beer, wine/champagne and liquor bottles with similar finishes are found, the wide finish, long neck and color of this neck seem to rule out those options. For now the specimen remains unattributed.

The neck shown in Figure 4.16d is embellished with three concentric rings. A second specimen from Fort Ellsworth is identical, except that only part of the upper ring remains on the neck. Another sherd exhibits a portion of the lower neck ring, plus some of shoulder. Still another is from the rounded shoulder. The latter two show nicely the finely spaced fluting beginning just below the lowest neck ring and extending to the shoulder.

Compared to other types, ringed necks are commonly found on toiletry bottles. Wilson (1981:69) shows a toiletry bottle with what appears to be three neck rings identical to the specimen illustrated here, but his bottle has a double-collar neck finish (and the shoulder style is different). He dates the Fort Union, NM, specimen to the period 1865-1890.

Figure 4.16e shows a wide-mouth finish, this probably from a Henry C. Kellogg bottle - insofar as it was associated with the Kellogg sherds of identical color (light green). This bottle has also already been described.

Other necks, not illustrated but already mentioned, include two specimens (with shoulder portions remaining) from yellow-green C.H. Swain bitters bottles, and two from log cabin bottles.

Various other sherds are partial necks and neck finishes. The way they have broken makes identification or speculation difficult. One partial neck is lime-green, and has a collar, but the finish is virtually absent. Possibly this is from a wine or champagne bottle. A light aqua lip is clearly from a wide-mouth container, but not a Gothic pickle bottle. Four sherds, three in aqua and one in light green, are also probably from the lip area of a wide-mouth. Two lime-green sherd show only part of a collar and a bit of the neck. A pale green sherd is broken from a bottle finish, part of which remains, as does part of the lip. Two other lipsherds are from bottles in clear and dark brown colors.

Bottle Bases

Bottle bases reported here are those not already discussed in previous sections. Like those bases, none described here has a base mark. These specimens do not add to the list of products and bottles earlier identified using sherds with other attributes. Rather they tend to support conclusions that wine, champagne, pickles, a Kellogg food product, and medicine and/or perfume were consumed at Fort Ellsworth.

The smallest base sherds are from cylindrical vial-like bottles, probably similar to the prescription or perfume bottle shown in Plate 21. There are three of these, two in aqua glass and one in lime-green. Only portions of the base remain on each (essentially they are broken in half). One was probably between 1 1/4 and 1 1/2 inches in diameter. Basal diameters of the others are 1 1/8 inches and 7/8 inch. The latter is probably the base which went with the neck illustrated in Figure 4.15a.

The largest bases exhibit characteristics of wine and champagne bottles. One heavily patinated, green specimen is the lower half (up to six inches of the body remains) of a massive cylindrical champagne bottle, perhaps a magnum. Basal diameter is 3 11/16 inches. The kick-up is 1 3/4 inches deep. A dark green base from a cylindrical bottle is slightly smaller in diameter (3 5/16 inches), and without a kick-up. Rather, the base is concave, some 3/8 inch deep. Up to four inches of body glass remains on this specimen. Attributes suggest it represents a wine bottle.

Four other green specimens are sherds from the perimeters of thick-glass bases. Three of them, which refit, are from one base; the other is from a different base. They too are probably from champagne or wine bottles. The specimens broke so close to the base perimeter that it is difficult to tell if the bases had kick-ups. More than likely they did not.

Two even smaller dark green sherds, which refit, are also from a cylindrical bottle. They show that the base on this bottle had a double concavity, the smaller one inside of and concentric with the larger. Another dark green sherd from the inner portion of a base, maybe from the same bottle, also exhibits this characteristic. Glass color and relative basal thickness suggests they too are from wine or champagne bottles.

An amber base from a square (2 3/16 inches), non-paneled bottle retains a small part of the body. This bottle had chamfered corners, and the basal edges are also chamfered. The base is slightly concave, a circular concavity 1 1/2 inches in diameter centered in the base. This base is similar to that of the C.H. Swain bottle (both square, amber, and chamfered), but at 2 3/16 inches square it is smaller. Also, the basal concavity diameter is greater than that on the Swain bottle.

Three amber sherds refit to form a complete base broken from what was probably an oval bottle. Minimum and maximum dimensions are 2 1/2 inches and 2 3/4 inches. The base is slightly concave. A small pontil mark is evident. Glass at the base is quite thick compared to that of the body, a small portion of which remains.

Only one side of an aqua base sherd is intact, making it difficult to tell if the specimen came from a square or rectangular bottle. If square, which is likely, it was probably 3 1/4 inches on the sides. The base exhibits a circular concavity (2 3/16 inch diameter). Basal edges are chamfered. Other sherds found with it suggest it is from a Gothic pickle bottle.

Another aqua specimen broke in a similar way, but it too is probably from a square bottle. This base, however, is smaller, probably originally 2 3/4 inches square. The circular concavity is 1 5/8 inches in diameter. Basal edges are chamfered.

A tiny basal portion remains on a sherd from a square or rectangular bottle. Dimensions cannot be ascertained. Glass color (lime-green) suggests it is from a Kellogg bottle of the kind already described, but this is not certain. Traces of a circular concavity remain on the specimen.

A handful of other base sherds are too fragmentary for sizing, and for recording much in the way of attributes. Two are from cylindrical bottles, one aqua and one brown. Two others are from square or rectangular bottles, one light green and the other yellow-green. The light green specimen is probably from a panel bottle.

Other Metal

Described here are the inevitable metallic objects that because of their shape, condition or state of fragmentation, or because they are an obscure part from some now-missing object, cannot be identified beyond guessing, if that. Few in number, they include ferrous and cuprous artifacts.

Ferrous Objects

A short, bent strip of thin ferrous metal exhibits folded edges (Plate 12, middle left). A narrow raised ridge runs down the strip on one side, and a corresponding trough runs lengthwise on the opposite side. The specimen weighs 1.1 grams.

Four amorphous cast iron fragments may or may not be from stove plate. Thicknesses of the three that can be measured range from .0745 to .120 inch (one specimen is badly rusted and cannot be measured).

Seven amorphous iron fragments weigh 19.2 grams. Another object appears to be a rust conglomerate (2.5 grams). If so, the substance is no longer magnetic.

Cuprous Objects

One specimen (Plate 12, middle center) is a thin ornamental band, now bent, crushed and folded. The band, which weighs 2.7 grams, exhibits a pressed vine-and-bud floral motif. Probably it is made of sheet brass.

A thin, small shield-like object is probably also made of sheet brass (Plate 4, lower left). The metal is .0245 inch thick. Two solder points are evident on one side. The object weighs .8 grams. A threaded brass cap is shown in top-view in Plate 4 (upper left) and Figure 4.7b. The cap, which has a countersunk top with three holes, is one inch in diameter. Perhaps the cap screwed into a threaded sleeve which fit on the lip of a bottle.

A short tubular brass object may be a ferrule. Outside diameter is about 1/3 inch, and the object is 3/4 inch in length. Running completely through it is a hole, which reduces in diameter from one end to the other. Diameter reduction is from 3/16 inch to 1/16 inch at the opposite end (which is slightly domed). The hole at the larger-diameter end is threaded, indicating that this object screwed onto another, perhaps a rod of some sort.

Figure 4.7c and Plate 4 (middle right) illustrate a thin, brass object of unknown function. Stamped on it is a partly intelligible patent date - \PRIL ?.18?? (only one leg of the A is visible, but faintly). In the 19th century, the U.S. Patent Office published patents weekly on Tuesdays in its *Annual Report* and *Official Gazette*. Using these sources, several years in which April 2, 3, 6 and 8 (the most likely days) fell on Tuesday were checked for the 1850s through 1870s, but without identifying the specimen. It may be that whatever the April day in the patent, it is not a Tuesday. If so, this is not a U.S. patent.

Also in the inventory is an amorphous cuprous fragment that weighs but half a gram.

Unidentified Non-Metallic Objects

One way to describe a puzzling non-metallic object (Plate 12, lower center) is that it looks somewhat like three sticks of cinnamon, one resting on the other two, roughly forming in cross-section a triangle shape. The rust-colored object is 1 1/4 inches long and 5/16 inch wide. Most likely it is an odd but natural sandstone formation.

Bone

Metal detecting found four bone and two tooth fragments in association with a metallic item. Three of the fragments are probably from mammal ribs; one is an epiphyseal fragment. In total, the six specimens weigh 35.3 grams.

Another bone item derives from Depression 13. It is a tiny fragment (<.1 gram). The thin specimen - .058 inch - exhibits a curved edge as if it broke from a prepared object.

Dating the Site

Terminus dates can be calculated for the site using temporally diagnostic artifacts. Calculations used here are not adjusted for variables which can skew dating, variables such as long-life objects, re-use, possible intrusions, uncertain dates, and the like. Rather all terminus dates available are used at face value assuming that a sufficiently large sample will tend to dampen skewing.

Where conflicting expert opinions assign an artifact two or more *terminus post quem* (TPQ) dates, the earliest is used to calculate terminus dates for the site. In some cases, an adjusted TPQ mean date can be obtained. This is done by changing early dates to reflect a later time when Euroamerican settlement of an area began. The adjusted date reflects the high probability that most Euroamerican artifacts arrived in the study area no earlier than the first settlers. This is not done here, however, considering there are few dates earlier than the time, the late 1840s, that settlement started in this part of Kansas.

Mean and median terminus dates are calculated in two ways. One calculation, called site dating, uses all temporally diagnostic artifacts. The other, called military dating, uses only military artifacts. Site dates are calculated first.

All 65 TPQ dates and all 40 *terminus ante quem* (TAQ) dates were used to calculate the site median and mean ranges (Table 4.1). On this basis, the mean dates for site occupation are from 1876.2 to 1884.1, or 1876 to 1884. Median dates show the same length, about 12 years, but lower the time range substantially. The median for 65 TPQ dates is 1860; the median for 40 TAQ dates is 1872. On this basis the site was occupied sometime during the period 1860 to 1872.

The incongruity between site mean and median ranges suggests that one or the other is skewed (or perhaps both). A check on skewing can be obtained by considering only artifacts known to have been used by the U.S. military (Table 4.2). The mean TPQ date for 20 known military artifacts is 1856, and the mean TAQ date of 17 artifacts is 1870.5. The median range is 1856 to 1866. The two ranges suggest the military occupied the site between 1856 and 1870, or more narrowly, 1856 and 1866.

The close agreement between site median and military mean ranges suggest that the site mean range of 1876 to 1884 is too high. More likely the 1860-1872 (site median) and 1856-1870 (military mean) ranges are closer to the actual time of occupation. These ranges are supported by the military median range of 1856-1866. Averaging the three suggests Fort Ellsworth was occupied sometime during the period 1857 to 1869. The period of occupation using the average of all four dates is 1862 to 1873. Using averaged dates, the maximum range is 1857 to 1873, while the minimum range is 1862 to 1869.

Both ranges - 1857 to 1873 and 1862 to 1869 - bracket Fort Ellsworth's time and duration - 1864 to 1867 - known from historical sources. The narrower range fits very well with the historical period. The fit, and the ability to clearly establish an Army presence using artifacts indisputably of military origin, support the identification of site 14EW26, Locality 6 as the location of Fort Ellsworth.

Table 4.1. Dates, Date Ranges of Site 14EW26, Locality 6 Artifact Types.

ARTIFACTS	DATE*	T. POST QUEM	T. ANTE QUEM
<u>Construction</u>			
window glass	19th cent.		
<u>Hardware</u>			
animal traps		1902	
cut nails			1887
barb wire (absence)			1873
<u>Military</u>			
Springfield appendage		1855	c1866
sabre hook & D-ring		1841	c1873
canteen		1858	1898?
shoulder scale stud		1854	
knapsack hook		c1853	c1872
triangular ring		c1853	c1872
belt catch		c1851	
strap hooks		c1853	
eagle insignia(?)		1858	c1872
general service buttons		1851	c1884
<u>Ammunition</u>			
Cartridge Cases			
Gallager		1862	c1866
Sage Works		1864	1866
FFV & Co.		1864	1865
U headstamp		1885	
F headstamp		1924	
Hi Speed headstamp		1927	
REM-UMC Hornet		1930	
Henry (?)		1860	1960
Shotshells			
UMC No 12 New Club		1892	1911
Western No 12 Field		1900	1931
Nitro 12 Ga Express		1911	1960
12 Ga Made in USA		1931	
Winchester Western 20 Ga		1964	
Lead Bars			
St. Louis Shot Tower		1858	c1875
Bullets (tentative IDs)			
Gallager		1862	1866
Springfield rifle musket		1855	c1866
.38 Special		1902	
.357 Magnum		1935	
.44 Special		c1907	
.44 Magnum		1955	
.44 Model 1860 Colt		1860	1873
.44 Colt Dragoon		1848	1855
Colt revolving rifle		1857	c1866
Merrill carbine		1858	c1866
country rifle			
bullet jacket	Civil War era	1880	

(continued)

Table 4.1. Dates, Date Ranges of Site 14EW26, Locality 6 Artifact Types
(con't).

ARTIFACTS	DATE*	T. POST QUEM	T. ANTE QUEM
<u>Personal Items</u>			
Jewelry			
Novelty Rubber Co. button		1855	1870
Coins			
Indian head penny		1865	
Lincoln memorial penny		1968	
Tobacco Items			
tin tags (absence)			1870
Eating/Cooking Items			
non-standard flatware			1872
Folding Knives			
Diamond Edge premium		c1890	
boy's jack		c1850	
<u>Apparel</u>			
Buttons			
white "agate"		c1860	
shell		1855	
Novelty Rubber Co.		1855	1870
Rubberized Cloth		c1840	
Buckles			
Patent July 10, 1855		1855	
<u>Ceramics</u>			
whiteware		c1840	
<u>Glass</u>			
Kelly's Old Cabin		1863	1870
Swain's bitters	1866		
Mexican Mustang Liniment		c1850	c1896
Davis' Painkiller		c1840	c1906
Kellogg bottle		c1862	c1893
Garnhart & Kelly bottle		1863	1865
peppersauce bottle		1851?	1867?
pickle bottle		1851?	1867?
barrel bottle		1850?	1875?
perfume/prescription bottle		c1860	c1880
ink bottle		c1858	c1903
<u>Cans</u>			
lapped seam cans		c1820	c1888
cone top		1935	
hole-in-top		1900	
US Tobacco lid		1977	1985
locked seams		1897	
scored		1866	
zinc lid		1858	
MEAN RANGE	1876.2 - 1884.1		
MEDIAN RANGE	1860 - 1872		

*known to exist at time indicated; not used in calculations
c or ? - varying degrees of uncertainty; used in calculations

Table 4.2. Dates, Date Ranges of Military Artifacts, Site 14EW26, Locality 6.

ARTIFACTS	DATE*	T. POST QUEM	T. ANTE QUEM
<u>Military</u>			
Springfield appendage		1855	
sabre hook & D-ring		1841	c1866
canteen		1858	c1873
shoulder scale stud		1854	1898?
knapsack hook		c1853	
triangular ring		c1853	c1872
belt catch		c1851	c1872
strap hooks		c1853	
eagle insignia(?)		1858	c1872
general service buttons		1851	c1884
<u>Ammunition</u>			
Cartridge Cases			
Gallager		1862	c1866
Sage Works		1864	1866
FFV & Co.		1864	1865
Henry (?)		1860	
Bullets (tentative IDs)			
Gallager		1862	1866
Springfield rifle musket		1855	c1866
.44 Model 1860 Colt		1860	1873
.44 Colt Dragoon		1848	1855
Colt revolving rifle		1857	c1866
Merrill carbine		1858	c1866
country rifle	Civil War era		
Eating/Cooking Items			
non-standard flatware			1872
MEAN RANGE	1855.9 - 1870.5		
MEDIAN RANGE	1856 - 1866		

Everyday Life at Fort Ellsworth

Dating the site provides a temporal frame for speculating on everyday life at Fort Ellsworth. Dating, however, indicates that some artifacts are intrusive, and cannot be considered. Those known to be intrusive are all shotshells, some cartridge cases (UMC, REM-UMC, Federal), several bullets (the Magnum and Special calibers), jacketed bullets, wire nails, the steel traps, locked seam and cone-top cans, the US Tobacco lid, at least two folding knives, and a penny. Other artifacts not so easily dated may also be from later periods.

Significantly, most known intrusive artifacts are types that can often be associated with largely ephemeral activities. Hunting and trapping are two, as indicated by ammunition components and traps. Others, such as pocket knives, tobacco items and coins, are types that can and do accumulate piecemeal across the landscape during decades of agricultural operations, and as a result of activities such as hunting, trapping, camping, and hiking. While such activities are interesting facets of land-use history, they are not dealt with here.

Other artifacts are most likely associated with everyday life at Fort Ellsworth. They provide the material basis for commenting on daily activities at Fort Ellsworth. These include dated materials, and undated artifacts not usually associated with ephemeral activities. The former includes glass containers. The mean *terminus* range for bottles is 1855-1882, while the median range is ca. 1855 to ca. 1877. Both ranges, based largely on embossing, are consistent with bottle technological features, principally mold lines and finishes which indicate a ca. 1860-1880 provenance. These ranges fit with site dating, indicating that bottle glass at the site accumulated during daily activities.

Dated materials unrepresentative of ephemeral activities also include the tin containers (pre-1888), nails (pre-1877), and eating utensils (pre-1872), thought to be soldiers' mess gear. For the latter, vaguely dated and undated items that signal day-to-day existence (non-ephemeral), examples are grooming items, ceramics, construction materials, building hardware, transportation materials, and so on.

Construction Activities

Already noted is a paucity of material evidence for substantial building activity at Fort Ellsworth. All in all, construction materials and building hardware are non-descript with little suggestion of architectural elaboration. A potential for complication in reading the material culture arises with the possibility that construction and hardware materials were salvaged for use in constructing nearby Fort Harker, the post which replaced Fort Ellsworth. If this happened, however, nails may have been the least likely salvage objects.

The cut common nail assemblage indicates that construction of frame buildings was minimal, if non-existent. At that, large-size commons and spikes are relatively few, suggesting little in the way of substantially built foundations and other load-bearing components. Finishing nails are so few that they cannot be used to posit well-finished building interiors, and plaster is absent. Bricks, used nearly exclusively in a bake oven and however poorly made, are not from

building walls and foundations. There are hints of stone used for building, but fieldstone that was not in any way dressed. This indicates an expedient, not planned use of stone in construction.

Building hardware is largely basic and non-descript. Sheet metal was used, probably for flashing, a usually critical component in poorly-constructed buildings susceptible to weathering, leakage and drafts - and a necessary item for repairing shoddy buildings. Evidence for standard door hardware is present, but scarce. Hinges are run-of-the mill butt hinges and pintels. There are few parts from locksets. Meat hooks are hardware typically found in barns and storage sheds, not domiciles.

Window glass seems a minor exception to mundane construction materials - given the delicate process of transporting it anywhere, much less across a remote frontier. But at Fort Ellsworth at least some of it - set as it was directly into mortar - was used in atypical fashion. This too suggests less-than-precise construction activity.

Work Activities

Other than the artifacts that signal military activities, a scarcity of tools points toward few specific jobs and occupations at Fort Ellsworth. Pails, of course, suggest the occasional if not repetitive chore. Iron-working, or blacksmithing, is one of the work activities most evident in the material culture. Modified and unmodified iron stock indicate that Fort Ellsworth personnel had the capability of meeting daily needs requiring hardware, if not tools, these likely hand-forged on the spot. So do animal shoes, and a few other items which were hand-forged.

Mule- and/or horseshoes, plus horseshoe nails, some buckles, slides and rings, a packing needle, and probably rivets, put work animals at the post, and farriers and leatherworkers, maintainers of draft and riding animal hardware, gear and tack. Another occupation - that of maintaining and repairing wagons - may also be represented at Fort Ellsworth. Wagon hardware suggests repairs to bows and boxes.

Repair and maintenance activity is suggested in what may be unused shoe nails and eyelets. So perhaps shoes and boots were repaired at the site. They were at least protected from wear by heel or toe plates. The chain repair link suggests maintenance of items more durable than footwear. And a broken spoon handle, perhaps re-attached to the bowl, suggests a repair episode. None of this is surprising. Repair activities should be common at remote posts if sporadically supplied. They should also occur as a result of economizing - as in the case of a low-paid private finding it necessary to repair rather than buy another spoon.

Military artifacts reveal the most obvious fulltime job at Fort Ellsworth - that of soldiering. But these artifacts provide either few clues regarding roles other than a military mission, or evidence for obvious actions such as firearm usage. One role might have been clerking - vaguely suggested by writing materials. Another activity related to the military role may have been bullet manufacturing. This is strongly indicated in sprue and fragments from lead shot bars.

Bullet molding does not suggest cartridge reloading at Fort Ellsworth. The U.S. Army did reload cartridges in the field, but beginning in the early 1880s when replaceable primers were adopted (Rickey 1963:98). Most likely, then, bars and sprue at the fort represent the manufacture of bullets for rifled muskets.

Blacksmithing, the farrier's work, wagon maintenance, and shoe repairing at Fort Ellsworth may have been jobs filled by military men. Most companies in the frontier Army designated one of their own as cobbler (Rickey 1963:109). As well, men designated as farriers, smiths and wagoners were ranked and paid as corporals (Rickey 1963:110). So it is not surprising to see these occupations represented, even if tentatively, in the archaeological record of a frontier military post.

Leisure Activities

Evidence in the Fort Ellsworth archaeological record for leisure-time and idle activities seems scarce. About the only representative artifacts are tobacco pipes, faint evidence for the pastimes of whittling bullets and carving makeshift articles, and writing, some of which undoubtedly was not job related. Noticeably absent are gaming pieces, children's toys, parts from non-issue musical instruments, sporting Paraphernalia, and hunting/fishing gear. Their absence does not necessarily signal a dearth of recreational activities at Fort Ellsworth. Many activities engaged in by soldiers on the frontier - theatrics, foot racing, and team sports, e.g., - would leave scant traces in the archaeological record.

Alcohol consumption might be considered a leisure-time activity. At the least it is usually consumed during off-hours. It is hard to know from material remains alone the social settings in which alcohol at Fort Ellsworth was consumed. Champagnes and wines are usual drinks at gatherings and dinners, while beer-drinking is typically more of a pastime.

Alcohol-based "medicines" at Fort Ellsworth, proprietary and patent, were consumed in the larger social setting of the 1860s and later. Bitters in particular rose during the mid-1800s when temperance movements began to gather steam (Rickey 1963:161; Freeman 1964:181), and when, during the Civil War, a high excise tax was placed on whiskey (Switzer 1974:77). Eventually over a thousand bitters brands - many endorsed or produced by physicians added to acceptability - were manufactured, most of them beginning after 1860 (Polak 1994:75).

During these times, bitters and other "medicinals" furnished a socially acceptable alternative to liquor. As well, they were often prescribed by post surgeons. And in some contexts - likely Fort Ellsworth was one - they simply provided a clandestine way to consume alcohol. So it appears the folks at Fort Ellsworth, some at least, were in tune with the drinking customs of the time. In this sense, the post differs little from contemporaneous Army forts on the western frontier - see for example Fort Phil Kearny, WY (1866-1868) (Fox 1994:132-136).

Household Activities

A few items - a thimble, pins, buttons, an apparel hook - signal sewing activities. They could represent apparel maintenance and repair, a common household activity whether on the frontier or not. Such items do not necessarily signal gender, at least in this context. Nineteenth century military men often found it necessary (as do soldiers of today) to perform their own routine sewing tasks. And if the identification of tailor's chalk is correct, perhaps sewing included making and altering garments. This could point toward a company tailor. This man, a soldier in the company, used his spare time to earn extra money by altering and remaking issue uniforms, by sewing on chevrons and the like, and by repairing clothing (Rickey 1963:109).

Grooming, hygiene and body adornment are also practices typically performed in the household. Items such as combs, the ubiquitous toothbrush, blacking bottles, shaving and other personal items are absent from the Fort Ellsworth assemblage. This seems surprising because they were available from the Ellsworth sutler (cf. Baer 1996:52, 53). Jewelry items are surprisingly few too, if tinklers and beads, both equally functional in trading activities, are eliminated, and if the wedding band is viewed as an emotional symbol, not body adornment. In fact, there is very little by which such practices can be posited. But a brush handle, bobby pin and mirror fragments (if from the period) at least suggest care of the hair.

Lamp glass and stove iron are indicators of routine household tasks such as tending the fire, emptying ashes, and maintaining oil lamps. But in this general sense such items are not particularly revealing since these activities can be expected. And in particular, the Fort Ellsworth artifacts are few, and they lack attributes that might allow some particular insight into household chores of this nature.

It is not possible to tell on the basis of extant information if the whiteware assemblage represents personal china, or if the sherds are remnants of department or company mess china (or all). Whichever the case, and however sparse, they probably represent some measure of formal dining activities, more so than can be inferred from the ironware mess gear found at Fort Ellsworth. The few decorated glass pieces - etched, molded and pressed - fit with this type of activity. And formal dining may have dictated the consumption during dinner of wine and champagne - beverages well-attested in the Ellsworth archaeological record.

Food Preparation and Consumption

As noted, the consumption of alcohol as it is represented in glass at Fort Ellsworth seems to fit socially acceptable drinking patterns of the mid to late 19th century, whether civilian or military. Another major and daily activity at any 19th century U.S. Army post was food preparation and consumption. Various artifacts suggest trends and preferences at Fort Ellsworth along these lines.

For one, there is evidence, slight as it might be, for communal cooking - the large roast/bake pan. Each company had its own mess, and commanders designated company cooks and bakers - enlisted men who prepared meals for the entire company. Soldiers in the company

were regularly detailed to assist the cooks (Rickey 1963:98; Utley 1973:85). Very likely the pan functioned in this capacity. The pan may even have been purchased from the sutler out of company funds. But specific preparations and amounts are not available in the archaeological record.

During most of the period 1865 to the 1890s, issue rations rarely included vegetables, except in small quantities and dried forms. The Army instead encouraged gardening, and typically each post or company had a vegetable garden (Rickey 1963:97; Utley 1973:85). Where available, this produce, good at preventing scurvy, furnished part of the daily sustenance.

Issue rations in the frontier Army included beans, hardtack, coffee, flour, salt bacon, contract beef and some condiments (Rickey 1963:116, 118). Normally they were delivered in bulk, and in the case of such things as flour, in non-durable containers such as sacks. Until the late 1880s, when canned tomatoes and beans were issued (Rickey 1963:117), rations rarely if ever included tinned foodstuffs. But beginning in 1866, and by act of Congress, canned fruits and butter could be purchased from the commissary department (Rickey 1963:118).

Most issue rations, and their packaging, tend to leave scant traces in the archaeological record. More durable items, at least for purposes of this report, are cans and bottles. Those at Fort Ellsworth furnish a glimpse into foodstuffs that supplemented issue rations, and garden produce if grown.

While the tin cans are generally silent about specific canned goods, they are from the perspective of quantity well-represented. That suggests soldiers at Fort Ellsworth did indeed supplement the routine diet. Perhaps canned vegetables and fruits were among the supplements - many cans are of that size. And canned meats may be a possibility. Tinned delicacies are also represented in the form of sardines.

Data available from bottles, while not plentiful, are a bit more specific. Clearly pickles supplemented the diet. At least one condiment - peppersauce, and perhaps mustard and ketchup helped make the daily fare more palatable.

Given the nature of issue rations of the time, these items - canned food, bottled pickles and condiments - probably came from the Fort Ellsworth sutler. He offered such things as canned tomatoes, canned fruits, canned meats, canned condensed milk, canned yeast powder, tinned oysters, and Gherkins, the latter perhaps in bottles (Baer 1996:52, 53). In addition to fresh foods, these are items, including sardines, that were generally sold by sutlers everywhere on the frontier (Rickey 1963:118-119).

Logistics and Supply at Fort Ellsworth

The purpose of Fort Ellsworth was essentially threefold. A Union presence in Kansas helped keep the new state (admitted in 1861) free of slavery. As well, troops at Fort Ellsworth assisted in protecting settlers and immigrants from Indian attacks. And while the post lay near the western frontier of the 1860s, it was situated on the Fort Riley/Fort Larned road, a major

route in a network which funneled critical Civil War supplies to the Union from the West and Southwest.

For the times, these were important, perhaps even critical aspects in the Union's political and military goals. It is fair to consider, then, how well the U.S. Army supported troops at Fort Ellsworth. One way to explore the issue is to seek clues in the post's material culture, and that can be done in two ways. First, the matter can be assessed by comparing Fort Ellsworth's material culture to what the Army had available at the time. Second, Fort comparisons can be made with artifact assemblages from other frontier posts of the period.

These approaches should give some idea of the Army's commitment to Fort Ellsworth. Clues pertaining to whether or not the Army was capable of properly supplying the post, but unwilling, are potentially less visible in the archaeological record. Of course, this problem arises only if material culture comparisons show that Fort Ellsworth was poorly supported. The question of why then becomes basically an historical problem. If artifacts are up-to-date, the problem does not arise.

Fort Ellsworth and the Times

Military artifacts found at Fort Ellsworth cannot be, for the times, considered representative of out-dated weapons and equipment. So it does not appear that Civil War demands impinged on the Army's ability or willingness to supply the post early in its existence. Nor are military artifacts so numerous that they allow proportional distinctions between types to be established. Thus neither a need nor a basis for distinguishing between supply patterns early and later in the post's history arises.

On the other hand, when asking if Fort Ellsworth was well-supplied, or poorly, a blanket yes-or-no answer cannot be expected. Troops may have been well-supplied in one area, but poorly equipped in another. For this reason comparisons with the Army of the times are made in several categories. They are weaponry, equipage and accouterments, rations, and construction supplies.

Weaponry

Quality and technological sophistication of firearms are most obvious factors in military capabilities. Were troops at Fort Ellsworth supplied with up-to-date weapons? The answer hinges on two factors - 1) weaponry represented in the archaeological record, and 2) the time period in question, which is 1864-1867. It possible to consider this period as a single block of time for two reasons - 1) it is a short period, and 2) sweeping changes in weaponry did not begin until about 1867 (contrary to the research design [Fox 1997:5]).

As previously noted, during this time, and earlier, the principal long arm of the U.S. infantry was the .58 caliber Springfield rifled musket. Cavalry long arms in the 1860s were hardly standardized, but Spencer and Sharps carbines proved to be favorites during the Civil War

(Utley 1973:70). As for sidearms, the official Army-issue between 1860 and 1875 was the .44 caliber Model 1860 Colt revolver, officially adopted in 1861 (Kopec and Fenn 1994:225).

Certain bullets and cartridge cases, plus an appendage, indicate that Springfield rifled muskets (1855-1867), Colt revolvers (1860-1875) and Spencers (1862/1863-1873) were at Fort Ellsworth (dates in this paragraph represent periods of official use by the U.S. military). The ammunition component indicates another official U.S. firearms of the period was present as well - the separate-primed Gallagher (1862-1866). Others suggested by bullets are the Colt Dragoon sidearm (1848-1855), the Colt revolving rifle (1857-1866) and the Merrill carbine (1861-1865).

The ammunition component seems to reflect two aspects of weaponry at Fort Ellsworth - 1) the well-attested non-standardized nature of U.S. firearms during the period, and 2) state-of-the-art firearms. Certainly the .58 Springfield rifled musket, the Spencer and .44 Colt were state-of-the-art, at least as viewed by Army officials who adopted them. So were Gallagers and Merrills, but if an 1863-1864 survey of officers is any indication, they were not well-received (McAulay 1981:42). Perhaps that is why some ended up at Fort Ellsworth. In any case, the archaeological record indicates the U.S. Army officials, at least at times, were willing and able to equip some, if not all Fort Ellsworth troops with the best firearms they could provide.

Equipage and Accouterments

Equipment and accouterment artifacts are those that establish beyond a doubt a military presence at the site. Although things like the Springfield appendage, wire sabre hook, the U.S. knapsack, official belts, strap hooks and general service buttons had been in service for some time (the sabre hook since 1841), such items in the 1860s were still parts of the official uniform and equipage. This includes the canteens found at Fort Ellsworth.

While these items are few, they do indicate that troops who arrived at Fort Ellsworth were at least initially officially equipped and dressed. How well they were able to maintain this status is another matter. But that probably mattered little, since standardization in equipment and uniforms during the 1860s, and even later, was lax. Not until 1883 did the Army adopt strict uniform and equipment standards. So comparisons with U.S. standards of an earlier time, particularly during the Civil War decade, are not perfect indicators of an ability and willingness to supply Fort Ellsworth. It seems fair to say, however, on the basis of known artifacts, that the appearance of Fort Ellsworth troops differed little from their counterparts elsewhere in the Army.

One indication of this is mess equipment. As noted, flatware at Fort Ellsworth, and a "mucket", reflect the Army's policy not to furnish soldiers with official mess gear. Whether the Army was able but unwilling to do so is unknown. But this was the case Army-wide, and the Ellsworth situation does not seem bear any significance on the supply issue.

Rations

Military food policies during the 1860s make it difficult to use material culture in assessing how well the Army met its ration responsibilities at Fort Ellsworth. Army regulations

of the time specified the content and amount of a ration. But as noted, most rations, including their packaging, were perishables that do not preserve well in archaeological context (except beef as bone in faunal assemblages).

Artifactual evidence for canned and bottled foodstuffs, mostly available only from the sutler or other retail outlet, could be offered indirectly as evidence that Ellsworth soldiers were poorly rationed. This may be the case. But if so, the situation at Ellsworth was probably not highly unusual. Rickey (1963:116-122) indicates that supplementing rations with store-bought foods (and gardening) was a typical practice in the frontier Army, one prompted by widespread dissatisfaction with the quality, quantity and monotony of ration issues. The practice may also have intensified after 1865, when an economically strapped Army reduced rations (Rickey 1963:116).

In short, nothing in the non-organic portion of the extant Ellsworth artifact assemblage bears conclusively one way or the other on the Army's ability or willingness to ration the post. Instead, the record seems to fit what is known generally about consumption patterns at frontier posts. Soldiers - generally dissatisfied with the official, but mundane fare - supplemented the ration diet with store-bought foods.

On-Site Fabrication

Since blacksmithing at frontier posts was a normal occupation, Army officials likely expected some measure of maintenance and repair through on-site fabrication. One characteristic of blacksmithing is expedient manufacture, sometimes for an unusual or unique purpose. That often makes it difficult to determine functions of hand-forged items - since they can be quite unlike standardized, mass-produced materials. But it is a characteristic that can make it easier to determine if a smith has fabricated an item that should have been supplied.

In the case of Fort Ellsworth, few of those artifacts thought to be hand-forged would suggest fabrication of standard items easily supplied. One exception might be what is probably a gate hook. Another could be the elaborate bracket shown in Plate 7, although its function has not been determined. Otherwise, bending round stock to form an eyed rod does not seem unusual. Neither does hand-forging animal shoes on-site - making shoes to fit the hoof, rather than trimming hoofs to fit a standard shoe - which was a normal practice.

Probably so was wagon repair, especially when maintenance involved the metal parts. Thus a wagon box rivet made by a smith does not seem out-of-place. Along the same lines, the presence of mass-produced wagon parts - bow staples, a box stay, and a tongue collar (?) - might indicate spare parts. If so, that would suggest Army supply logistics provided some support for wagon maintenance and repair.

By and large, hand-forged items in the artifact inventory pale in quantity and variety when compared to mass-produced materials of metal. Thus it would seem, on the basis of extant data, that Fort Ellsworth's blacksmiths were not overly taxed in repairing and replacing items that under normal conditions should have been supplied by the quartermaster.

On the other hand, on-site bullet manufacture suggests ammunition supply might have been less than perfect. One could expect that if the Army insured that troops had decent firearms, as seems the case, then ammunition would follow regularly. But there could have been a problem with bullets for the .58 Springfield rifled musket. The Army discontinued manufacture of these in 1865 (Smith 1960:236), before Ellsworth closed. Since there is so far no evidence that Ellsworth received the Allin-conversion Springfield, which replaced the rifled musket, perhaps there was a need to make ammunition. Of course a complicating factor is the possibility that lead bars and sprue were left behind by civilians who passed through Ellsworth.

Construction Supplies

The part of the artifact assemblage that represents construction and architectural aspects of Fort Ellsworth is striking. As earlier mentioned, a picture of a very insubstantial facility appears. An ideal post-Civil War fort was an unpalisaded complex of well-planned buildings (if sometimes poorly built) - framed, brick, stone, or a combination - arranged to form an expansive parade ground. The ideal pattern isolated enlisted barracks from officer's quarters by placing them at opposite sides of the quadrangle, and utilized important administrative and supply buildings to finish the enclosure.

Material culture alone cannot establish the building pattern at Fort Ellsworth, but it does suggest that Army officials did not care to create an ideal post, or anything close to it. Why that might be - inability or unwillingness - seems a matter of historical research, especially in light of Fort Harker, an "ideal" post which soon replaced Ellsworth. But just how insubstantial Fort Ellsworth was can be portrayed by briefly noting the kinds of material supplied for the creation of another, even more remote frontier post - Fort Phil Kearny in Wyoming.

Comparing Forts

Making comparisons between material assemblages from different sites can sometimes be a risky business. Sites are excavated with different goals in mind, in varying intensity and with different strategies, and by using different recovery methods. Thus results presented here are tentative, and at best should be considered as sources for ideas and hypotheses to be explored in the historical record.

The two military facilities used for comparative purposes are Fort Phil Kearny, Wyoming, and Fort Leavenworth, Kansas. The former is selected because it was, like Fort Ellsworth, a frontier outpost, and the two are virtually contemporaneous. Fort Leavenworth also was occupied while Ellsworth existed. This facility, however, was a major logistical post for many years, and in fact it was the principal supply source for Fort Ellsworth, making it at face value a good comparative yardstick.

Fort Phil Kearny

Fort Phil Kearny differs but slightly from Fort Ellsworth, at least in its temporal and functional contexts. Built in 1866 along the Bozeman Trail (construction started July 15), and abandoned in 1868 (August), the Wyoming fort overlapped in time with Fort Ellsworth. Both existed for short periods of about the same length. Both were on the western frontier, and on major roads, and both served to protect immigrants from Indians. There the similarities stop.

Fort Phil Kearny was a huge palisaded facility. The main section - quarters, administrative buildings, etc. - encompassed nearly a half million square feet. An attached yard with stables and maintenance buildings, also palisaded, took up more than 350,000 square feet. The installation, in short, was little short of an "ideal" post-Civil War fort - in this case frame buildings of all kinds - carefully planned and laid out.

Colonel Henry Carrington, the fort's first commander, pre-planned much of the post while in winter quarters at Fort Phillip Kearney in Nebraska. During the pre-planning stages, Carrington requisitioned the necessary supplies and equipment, which took 226 wagons to transport (Carrington 1983:45). Carrington's (1983:39-40) wife reported "tools of all kinds", and "mowing machines, shingle and brick machines, doors, sash, glass, nails, locks, and every conceivable article that can enter into house-building" filled the wagons. General William B. Hazen (1866:13) visited the new fort in 1866, reporting that "everything transportable is here in abundance."

What is known of the material record at Kearny, especially construction and architectural material (Fox 1992, 1994), fits the picture painted by Hazen and Mrs. Carrington. Even glazing compound used to secure panes in sashes was found. Kearny construction, architectural and hardware materials included everything found at Ellsworth plus cut stone, whetstones, plaster, many framing nails, carriage and chair nails, fancy hinges, hasps, solder, padlocks, door lockplates, a harness T-bar, and bridle bit.

Material remains from Fort Phil Kearny show that construction wants there were well-served. Not surprisingly, artifacts paint a similar picture for the military component. Like Ellsworth, bullets and cartridge cases indicate a variety of then-modern U.S.-issue firearms, including the .58 Springfield rifled musket, the Allin-conversion, Gallagers, .44 Colt revolvers, and Spencers (Galloway 1967:28-29). Other ordnance includes percussion caps for the Springfield (and others), plus cannon primers and case shot for the then-modern mountain howitzer.

Kearny artifacts representing military equipment and accouterment types, especially the latter, are somewhat more numerous than those found at Ellsworth. Various scale, epaulet and stud parts, insignia, buttons, hat hardware, belt plates, strap and knapsack hooks, and belt and knapsack rings have been recovered (Fox 1994:73; Galloway 1967:29-31, 33-34). As official issue items, or parts on issue items, these date from 1839 to about 1873, and, like Ellsworth, more or less mirror the properly uniformed and equipped soldier of the day.

It is worth noting that formal excavations at Fort Phil Kearny produced evidence for animal feed, but nothing related to the nature of soldiers' official rations. Instead evidence for supplementary consumption turned up, but unlike Ellsworth not much in the way of tinned foods - except for can keys and lids. Instead, and like Ellsworth, glass at Kearny indicates soldiers purchased bottled foods, probably from the sutler's store, an area that was excavated. Waterscreen samples from the store locality also yielded nutshells (acorn, pecan, hazelnut, walnut) and fruit pits (peach and cherry).

Alcoholic beverages and "medicinals" are also represented in bottle glass sherds from Kearny. Types and brands include stout, champagne, schnapps, whiskey, gin, and bitters (Drake's Plantation, Kelly's Old Cabin) (Fox 1994:82, 115; Galloway 1967:36-39). These represent a few more beverages than so far known for Ellsworth. More importantly, Kearny, like Ellsworth, so far as artifacts admit, seems to fit the pattern of alcohol consumption at frontier posts of the times. Evidently the sutlers at both places had little trouble supplying a money-maker.

Few items (harness T-bar, perhaps heavy chain) found at Kearny provide little comparative data for the role of transportation in supply. In any case, the government contracted wagon transportation to and from Fort Phil Kearny, and so did not assume repair and upkeep responsibilities, at least for freight wagons. Also, no clearly hand-forged articles from Kearny have been reported, making it impossible to compare on-site fabrication activities with Fort Ellsworth.

Fort Leavenworth

This fort in the 19th century was, except for "worth" in the names, substantially different from Fort Ellsworth, or for that matter from other military installations surrounding it. What became Fort Leavenworth, which is still in operation, was established in 1827 on Missouri River near the mouth of the Platte. Its early function was to provide protection along parts of the Santa Fe Trail. Over the years functions and responsibilities changed. During the Civil War, Leavenworth served as an arsenal, supply, training and organization base, continuing its arsenal and supply functions as a garrison post until 1874 and the early 1880s, respectively. Thereafter, the Army located its infantry, cavalry and general service schools there, and a prison (Wagner *et al.* 1993:14-25).

As a major supply post, and the principal source of Fort Ellsworth government supplies, Fort Leavenworth ought to provide a good standard by which satellite post supply issues can be examined. Results of 1992 Phase II excavations at Leavenworth, and at the nearby Fincher dump site (14LV358) (Wagner *et al.* 1993), referred to here as the Leavenworth sites, are the source of material culture comparisons used here (in fact, most comparative data are from the Fincher site).

One thing is clear from the 1993 results - Leavenworth and Fincher material culture spans many decades. In comparing the two assemblages, only those artifacts from the Ellsworth time period are considered. Also, only the military component is addressed in any depth. Testing at

the Leavenworth sites revealed some construction and hardware material, but too little for systematic comparison. In any case, it is known historically that the built landscape at Fort Leavenworth was early-on complex and elaborate, and that it was periodically modified as the post grew. As well, much is still standing, making it uncertain how well archaeological remains might represent construction and hardware elements at the fort.

Like Fort Ellsworth, whiteware is present at the Leavenworth sites, but one specimen, a bowl, is marked with the Quartermaster Department stamp (Wagner *et al.* 1993:142). This, of course, would have been an issue item. Wagner and his associates make no mention of hand-forged items, so on-site fabrication activities cannot be compared. Neither do they mention anything, other than bone remains, that might be construed as remnants of official rations. Remains of cans and food bottles are also sparse.

Weaponry is represented in Leavenworth ammunition components. A .50-70 cartridge case (Wagner *et al.* 1993:65) dating from 1886 to 1873 signals the presence of the Allin-conversion Springfield, or the later true .50 caliber Springfield rifle. The earliest the Allin-conversion could have arrived at Leavenworth is late 1866. If it did arrive that early, there is no extant evidence at Ellsworth to suggest the new weapon made it there. Perhaps the Allin-conversion rifle arrived at Leavenworth around or after the time - Spring, 1867 - that Fort Ellsworth was abandoned, and in time to get it to the Bozeman Trail forts by mid-summer, 1867 (Phil Kearny and C.F. Smith).

The Springfield rifled musket, however, seems well attested in the form of .58 caliber Minie balls at the Leavenworth sites. A .52 caliber Sharps bullet suggests that another military arm, the Model 1859 Sharps breech-loading percussion rifle or carbine was used at Fort Leavenworth. This arm does not seem to be represented in the Fort Ellsworth material record. Those military arms indicated for Ellsworth but absent from the 1992 Leavenworth assemblage are the Gallagher, Spencer and Colts.

Military accouterment and equipage artifacts from the Leavenworth sites are quite similar in kind to those found at Ellsworth. Early button styles are present, but so are 1851-1854 line-eagle general service buttons identical to those at Ellsworth. Brass shoulder scales were also found. Scales are absent from the Ellsworth assemblage, but the wing stud attachment is not. Other similarities between the two assemblages include knapsack strap adjustment hooks, a wire sabre hook, and a canteen stopper pull. The only items not reported for Ellsworth are a brass aglet and pewter button marked US ARMY (Wagner *et al.* 1993:110, 166-167, 171).

Comparisons suggest few differences in arms, equipage and accouterments, the strictly military aspects of the two facilities. How this comparability might translate into Leavenworth's commitment to supplying Fort Ellsworth is vague. Leavenworth exhibits evidence for the most modern arm of the time, but Ellsworth was abandoned about when they became available, or very soon afterwards. In turn, Ellsworth exhibits evidence for weapons not yet found at Leavenworth. But this may be a function of the limited nature of excavations at Leavenworth. So these differences in arms may be as much a matter of timing and chance as design.

Otherwise, it seems that soldiers at both facilities during the time in question were similarly equipped and dressed.

Conclusions

Material culture recovered in 1995 and 1996 testing and excavations at Site 14EW26 support the identification of Locality 6 as the location of Fort Ellsworth. Support is provided in two ways. First, military equipage and accouterment artifacts establish without serious doubt a military presence at Locality 6. These types of artifacts simply could not have accrued as a result of non-military occupation. Overall, the kinds of equipment and accouterment artifacts recovered, plus other artifacts representative of daily life, strongly indicate a prolonged military presence, not a short stay.

Factors which establish a protracted military presence allow various ammunition components to be confidently interpreted as representative of U.S. Army official-issue firearms. This link is important because many issue arms, including most represented at Fort Ellsworth, were also available on the commercial market. The situation, here or at any historic site, makes any *a priori* military link premature. This leads to the second line of support for Locality 6 as the site of Fort Ellsworth. Dating of military arms, equipment, and accouterment artifacts establishes an occupation from either 1857 to 1873 using the wider calculated parameters, or considering the narrower, from 1862 to 1869. Both periods bracket the Fort Ellsworth period known from historical sources, namely June of 1864 to the Spring of 1867. The narrower range fits very well with the historical period.

A number of time-diagnostic artifacts fall well outside this temporal assignment. Such things as late 19th and 20th century ammunition components from shotshells and cartridge cases, a handful of wire nails, steel traps, a few can parts, two folding knives, and a Lincoln penny doubtless are intrusive. These represent artifact types that can and do come to dot the landscape during decades of farming - the general agricultural scatter, and as a result of ephemeral activities like hiking, hunting, camping and trapping.

But other time-sensitive artifacts in the collection do fit a third-quarter-of-the-19th century temporal provenance. Certain buttons were only made between 1855 and 1870, for example. But most striking are the bottle glass and tin can components. Using the median *terminus* range, glass from bitters, other medicinals, liniment, and foodstuff bottles date from 1855 to 1877. And virtually every can and can part with technological attributes comes from the lapped seam era which began to fade about 1888. Prolonged occupations produce these kinds of containers. Since they can be linked temporally to the Fort Ellsworth occupation, they probably are so linked, particularly since there is no indication of earlier or later historic occupation at the site.

Linking these and other quasi- or non-military artifacts to the 1864-1867 military occupation makes it possible to use material culture to comment on some activities which characterized everyday life at Fort Ellsworth. Analyses of work, leisure, household, food preparation and consumption related artifacts paint a picture not too different from that known

historically for post-Civil War forts on the western frontier. In this sense, then, daily life at Fort Ellsworth probably did not differ much from the mundane, hum-drum, often tedious existence at frontier outposts.

Quite possibly another factor added to the hardships of frontier military service at Ellsworth - substandard physical facilities at the post. Construction and hardware artifacts - the limited and basic types extant in the collection - point to a crude facility. Little in the material remains suggests the "ideal" post-Civil War installation, a geometrically planned complex of substantial buildings - framed, brick, stone or some combination.

If so, answers to why this might seem better sought in the historical record. Perhaps Army officials intended only a temporary facility. Military officials did establish posts with a temporary longevity in mind. Fort Supply, sited in Oklahoma in 1868 (decommissioned in 1894), slightly after Ellsworth's time, was one, but after 10 years the post was made permanent, and the substandard facilities were upgraded (Briscoe 1992:2-6). This is similar to the Ellsworth situation. Fort Harker replaced Ellsworth, but was built a mile or two away. Perhaps some part of the Ellsworth architectural component escaped the archaeological record as workers salvaged material for use in constructing Fort Harker.

Whatever the situation, the extant Ellsworth material record in no way matches a contemporaneous frontier post, Fort Phil Kearny, Wyoming (1866-1868). Not only did the two overlap in time, they were both short-lived posts, and they in part served similar functions - protecting supply and immigrant roads. But Kearny was the "ideal" post. Historical and archaeological records show a huge facility comprised of many well-constructed and well-finished frame buildings. Costs and efforts expended to transport hundreds of wagon-loads of construction and architectural material to the frontier were enormous.

Clearly here there is an enormous contrast in commitment to the two built landscapes, if not the way the Army provisioned both forts with arms, military equipment and accouterments. But the contrasting commitments in facility construction indicates political and military goals at the two locations must have been substantially different. Material culture cannot suggest these goals, but it does raise questions of why, the answers to which can be sought in the historical record.

Fort Leavenworth of the time was an important and critical Army facility. As the major logistics and supply outlet for the region - Leavenworth supplied Ellsworth - this fort must have been well-built and well-provisioned. Military artifacts in the Leavenworth archaeological record, however, do not present a marked contrast with counterparts in the extant Ellsworth material record. Comparisons suggest that Fort Ellsworth did not lack in then-modern Army-issue arms, military equipment and military accouterments. Neither did Fort Phil Kearny, at least as determined from artifacts recovered there.

So material culture analysis suggests that Army officials were able and willing to maintain the strictly military capability of soldiers stationed at Fort Ellsworth, and that this commitment did not stop at Ellsworth, reaching deeply into the frontier as far as remote

Wyoming. The Army's commitment to the quality of living facilities at Fort Ellsworth, however, probably pales in comparison not only to the military capability, but also contemporaneous forts. This dichotomy - support and non- or minimal support - presents an interesting facet of the frontier Army, probably a facet entirely dependent upon changing political and military whims of the time. And doubtless this situation was one which plagued other outposts along the western frontier.

CHAPTER 5

BONE AND SHELL REMAINS

by
John R. Bozell

Introduction

This section provides a description and assessment of faunal remains recovered from archaeological investigations at Fort Ellsworth, Kansas in 1995 and 1996 by the U.S. Army Corps of Engineers (Kansas City District) under the overall direction of Dr. Robert Ziegler. Analysis of recovered bone and shell is an important aspect of the Fort Ellsworth research program. In addition to narrative and tabular descriptive treatment of the collection this analysis focuses on a variety of research questions. The most prominent include: 1) characterization of the Fort Ellsworth diet with respect to wild versus domestic meat, 2) butchering patterns and cuts of meat reflected in the sample, 3) variation between major analytic units and 4) placement of the Fort Ellsworth diet in regional and historical perspective.

Laboratory Procedures and Analytic Units

Following excavation, bone and shell debris was washed, cataloged and segregated from other material classes by Kansas State Historical Society staff. Their specimen inventory lists the frequency of fragments for each provenience but individual pieces were not labeled with catalog numbers. The sample was submitted to the author during the spring of 1997 and at that time the collection was packaged in individual containers labeled with relevant provenience information and catalog numbers. All sorting and bone identification was completed by the author. Trish Nelson identified the shell remains.

Materials from each provenience unit were segregated into identifiable and unidentifiable lots. Potentially identifiable specimens were labeled with catalog numbers and subdivided into the following categories for further treatment: cattle, swine, deer or pronghorn, small mammal, reptile/amphibian, egg shell, mussel shell, bird and fish. Several fractured specimens were glued but other formal stabilization measures were not taken.

The collection is well preserved and the proportion which could be identified is high. A specimen was considered identifiable if the element, side and portion could be determined and assigned to a taxonomic grouping at the family level or below. Most remains were identified through comparison with modern reference collections in possession of the author as well as those curated by the Nebraska State Historical Society and the National Park Service (Midwest Archaeological Center) both in Lincoln, Nebraska. Variables recorded for each identified item include: catalog number, provenience, taxon, element, side/portion and various comment fields. Comment fields noted natural or cultural characteristics such as burning, butchering marks, meat

cut value, erosion and gnawing by rodents or carnivores. Immature specimens were also noted. These data were placed in a computerized database (Microsoft Access) using a coding format designed for use with archaeological faunas (Falk et al. 1979).

The identified portion was quantified using the number of identified specimens (NISP) and minimum number of individuals (MNI) for each taxon. MNI values were tabulated using the standard method of determining the element, side and portion that occurs in the greatest frequency for a given taxon (Grayson 1984). Relative age was also taken into consideration. NISP and MNI values were calculated for the sample as a whole and NISP counts re-tabulated by various gross analytic units identified by project staff. Analytic units producing faunal remains include: Dugout 10, Dugout 13, Knoll, Flats, and Surface.

Results

The Fort Ellsworth vertebrate sample is composed of 3445 fragments weighing 12,399.3 grams (Figure 5.1). Of these, 449 pieces weighing 105 grams were retrieved from flotation processing. Six-hundred and thirteen fragments proved identifiable using criteria noted above. By weight the identified bone sample constitutes 71.1% of the entire collection and includes 21 taxonomic groups representing a minimum number of 29 individuals. Modified bones were not recovered. The bone collection is very well preserved with minimal surface erosion. Erosion that did occur is a product of weathering and to a lesser extent gnawing by rodents and carnivores. These agents however do not appear to have made a serious impact on the ability to identify remains. Bone fragmentation is largely a function of butchering practices although the actions of gnawing carnivores and rodents were occasionally noted.

The unidentifiable portion of the collection, 2832 specimens (3596.9 grams), is summarized by analytic unit in Table 5.1. Unidentifiable debris was not systematically tabulated by class (bird, fish, mammal, reptile, amphibian) but the vast majority is small fragments of large mammal bones. Trace amounts of bird, fish, and smaller mammals were noted. By weight over 93% of the unidentifiable bone debris were recovered from Dugout 13. Non-bone materials within the sample include small amounts of egg, mussel, and gastropod shell. Full inventories of shell and bone remains are on file at the Kansas State Historical Society.

Shell

The eggshell remains could not be identified but they almost certainly are chicken -- which comprise 97% of the identified bird bones. By weight over 85% of the eggshell was recovered from flotation processing. Eggshell distribution is provided in Table 5.2. The sample is composed of 2545 fragments weighing 29.5 grams.

Other shell remains include mussel shell and gastropods and they are summarized in Table 5.3. The combined gastropod and mussel collection is comprised of 160 fragments

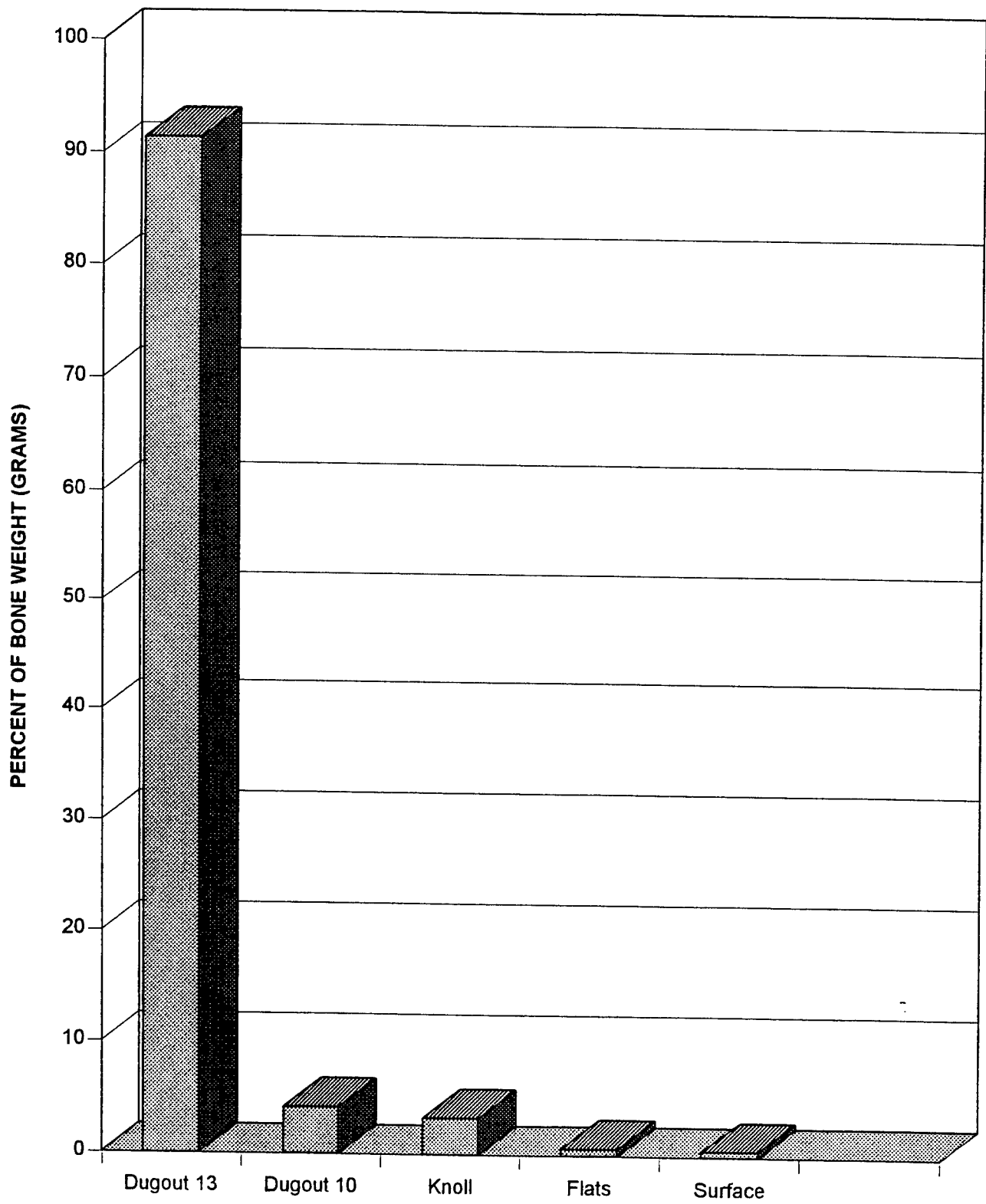


Figure 5.1. Percent of bone weight by analytic unit.

Table 5.1. Summary of Unidentifiable Bone Debris Recovered from Fort Ellsworth.

Analytic Unit	Number	Grams
Knoll	50	55.4
Knoll (Flot)	24	1.5
Dugout 10	143	121
Dugout 10 (Flot)	16	1
Dugout 13	2170	3314
Dugout 13 (Flot)	348	46.7
Flats	35	56.8
Flats (Flot)	46	.7
TOTAL	2832	3597.1

Table 5.2. Eggshell Recovered from Fort Ellsworth.

Catalog Number	Analytic Unit	Grams	Number
67	Dugout 13	.1	1
69	Dugout 13	.1	1
580	Dugout 13	1.1	45
587.2	Dugout 13	.1	4
665	Dugout 13	.1	8
673	Dugout 13 (Flot)	.4	40
778	Dugout 13 (Flot)	.6	70
897	Dugout 13 (Flot)	.5	48
898	Dugout 13 (Flot)	.3	39
924	Dugout 10	.1	6
926	Dugout 13 (Flot)	1.3	131
930	Dugout 13	.4	8
1003	Dugout 10	1.5	11
1013	Dugout 13	.1	11
1040	Dugout 10 (Flot)	4.5	432
1044	Dugout 13 (Flot)	.1	15
1054	Dugout 13 (Flot)	1.8	196
1058	Dugout 13 (Flot)	.3	22
1060	Dugout 13 (Flot)	16.1	1466
TOTAL		30	2545

Table 5.3. Inventory of Shell Recovered from Fort Ellsworth.

TAXON	UNKNOWN	LEFT VALVE	RIGHT VALVE	GRAMS
Unionidae		5	4	6.6
<i>cf. Lampsilis sp./Uniomerus</i> <i>sp.</i>			1	0.3
<i>cf. Proptera sp./Lampsilis sp.</i>		2	1	11.0
<i>cf. Quadrula sp./Fusconia</i> <i>flava</i>		7	4	40.0
<i>cf. Lampsilis sp.</i>		1		0.6
<i>Uniomerus tetralasmus</i>			2	7.0
gastropods	8			0.5
small valves	10			1.0
unidentified fragments	115			31.4
TOTAL	133	15	12	98.4

weighing 98.4 grams. Nearly 95% of these are mussel shell valves, valve fragments and unidentifiable pieces. Most of the sample is unidentifiable (66% by number and 38.3% by weight). Identified taxa include: *Unio merus tetralasmus* (pond-horn mussel), *Lampsilis* sp. (sand mussels), and possibly species of *Proptera*, *Quadrula*, and *Fusconia*. Some specimens were identified as only members of the Unionidae family. Inadequate reference collections prevented identification of the gastropod sample.

Interestingly, much of the identified mussel sample is represented by species that now inhabit portions of Kansas somewhat to the east and southeast of the Fort Ellsworth area (Murray and Leonard 1962). It is also noteworthy that most mussel remains were recovered from the Knoll area, not Dugout 13 where most of the bone originated. Procurement of mussels by the military on the Great Plains is not well documented -- but it certainly is for the Central Plains prehistoric tradition (Wedel 1986:230). Although the origin of the shell sample from Fort Ellsworth is unclear they spatially co-occur with Smoky Hill phase material and are likely related to this precontact Native American component. The modern geographic distribution of taxa represented may indicate slightly moister conditions during the Smoky Hill phase occupation.

Identified Vertebrate Remains and Distribution

The 613 identified bones are assigned to 21 fish, reptile, amphibian, bird or mammal taxonomic categories (Table 5.4). Table 5.5 is a summary of the identified remains by analytic unit. Table 5.6 provides summary information on modifications observed on the identified bone sample. Dugout 13 yielded nearly 78% of the identified sample followed by Dugout 10 (16.3%) and the Knoll (4.6%) with trace amounts from the Flats and the site surface. The sample is dominated by cattle bones (55% by NISP and 90.4% by bone weight). Other relatively common taxa include: swine (NISP=13.5%), box turtle (5.0%), chicken (5.4%), and cottontail rabbit (10.4%). The remaining taxa constitute no more than 1.8% of the identified sample.

Fish

The fish assemblage is comprised of six *Lepisosteus* sp. (gar) elements -- one from Dugout 13 and five from the Knoll area. The sample includes five scales and one cranial fragment and represents about 1% of the combined identified assemblage. These remains are not sufficient to make a specific taxonomic determination. Four unidentified fish bones were recovered from Dugout 13 and one of those is burned. Fish were obviously a minor component of the Fort Ellsworth diet.

Reptile

Thirty-one reptile bones (5.0% of NISP) were recovered and all are identified as "probably" *Terrapene ornata* (ornate box turtle). The possibility the remains could be from the osteologically similar *T. carolina* (Florida box turtle) could not be eliminated, however the modern range of this southeastern species extends westward only to about 100 miles southeast

Table 5.4. Summary of Identified Vertebrate Remains from Fort Ellsworth.

TAXA	NISP	MNI
<i>Lepisosteus</i> sp. (gar)	6	1
cf. <i>Terrapene ornata</i> (box turtle)	31	1
Bufonidae (toad)	1	1
Galliformes (chicken, grouse etc)	9	1
<i>Gallus gallus</i> (domestic chicken)	37	4
Icteridae (blackbird, meadowlark etc)	1	1
Soricidae (shrews)	1	1
<i>Sylvilagus floridanus</i> (cottontail)	62	3
<i>Lepus</i> sp. (jackrabbit)	3	1
Cricetidae (native mice)	3	1
<i>Microtus</i> sp. (vole)	2	1
<i>Rattus</i> sp. (rat)	4	1
Carnivora (carnivore)	1	1
<i>Mephitis mephitis</i> (striped skunk)	2	1
<i>Sus scrofa</i> (swine)	83	1
<i>Odocoileus</i> sp. (deer)	3	1
<i>Antilocapra americana</i> (pronghorn)	10	1
<i>Bos taurus</i> (cattle)	336	3
<i>Capra/Ovis</i> (goat/sheep)	1	1
<i>Odocoileus/Antilocapra</i> (deer/pronghorn)	6	1
<i>Homo sapiens</i> (human)	11	1
TOTAL	613	29

Table 5.5. Summary of Identified Fort Ellsworth Vertebrates by Major Analytical Unit.

TAXA	Dugout 10	Dugout 13	Knoll	Flats	Surface	TOTAL
<i>Lepisosteus</i> sp. (gar)	0	1	0	5	0	6
cf. <i>Terrapene ornata</i> (box turtle)	0	31	0	0	0	31
Bufonidae (toad)	0	1	0	0	0	1
Galliformes (chicken, grouse etc)	0	9	0	0	0	9
<i>Gallus gallus</i> (domestic chicken)	6	31	0	0	0	37
Icteridae (blackbird, meadowlark etc)	0	1	0	0	0	1
Soricidae (shrews)	0	1	0	0	0	1
<i>Sylvilagus floridanus</i> (cottontail)	60	2	0	0	0	62
<i>Lepus</i> sp. (jackrabbit)	2	1	0	0	0	3
Cricetidae (native mice)	0	2	0	1	0	3
<i>Microtus</i> sp. (vole)	2	0	0	0	0	2
<i>Rattus</i> sp. (rat)	0	4	0	0	0	4
Carnivora (carnivore)	1	0	0	0	0	1
<i>Mephitis mephitis</i> (striped skunk)	0	1	1	0	0	2
<i>Sus scrofa</i> (swine)	12	71	0	0	0	83
<i>Odocoileus</i> sp. (deer)	0	0	1	1	1	3
<i>Antilocapra americana</i> (pronghorn)	8	0	2	0	0	10
<i>Bos taurus</i> (cattle)	8	315	12	0	1	336
<i>Capra/Ovis</i> (goat/sheep)	0	1	0	0	0	1
<i>Odocoileus/Antilocapra</i> (deer/pronghorn)	1	4	1	0	0	6
<i>Homo sapiens</i> (human)	0	0	11	0	0	11
TOTAL	100	476	28	7	2	613

Table 5.6. Summary of Modifications Recorded on the Fort Ellsworth Vertebrate Sample.

TAXA	Burning	Rodent Gnawing	Carnivore Gnawing	Cut Marks	Immature Specimen	Poor/Fair Condition
<i>Lepisosteus</i> sp. (gar)	0	0	0	0	0	0
cf. <i>Terrapene ornata</i> (box turtle)	0	0	0	0	0	0
Bufonidae (toad)	0	0	0	0	0	0
Galliformes (chicken, grouse etc)	0	0	0	0	0	9
<i>Gallus gallus</i> (domestic chicken)	4	0	1	7	1	3
Icteridae (blackbird, meadowlark etc)	0	0	0	0	0	0
Soricidae (shrews)	0	0	0	0	0	0
<i>Sylvilagus floridanus</i> (cottontail)	0	1	0	0	2	7
<i>Lepus</i> sp. (jackrabbit)	0	1	0	0	0	1
Cricetidae (native mice)	0	0	0	0	1	0
<i>Microtus</i> sp. (vole)	0	0	0	0	0	0
<i>Rattus</i> sp. (rat)	0	0	0	0	2	0
Carnivora (carnivore)	0	0	0	0	0	1
<i>Mephitis mephitis</i> (striped skunk)	0	0	0	1	0	0
<i>Sus scrofa</i> (swine)	1	3	10	29	58	15
<i>Odocoileus</i> sp. (deer)	0	0	1	1	1	0
<i>Antilocapra americana</i> (pronghorn)	0	0	1	1	0	5
<i>Bos taurus</i> (cattle)	34	7	72	160	114	49
<i>Capra/Ovis</i> (goat/sheep)	0	0	1	0	0	0
<i>Odocoileus/Antilocapra</i> (deer/pronghorn)	0	0	0	4	0	3
<i>Homo sapiens</i> (human)	0	0	0	0	1	4
TOTAL	39	12	86	203	180	97

of the project area (Conant 1975: maps 28-32). All turtle remains were recovered from Dugout 13 and a minimum of only one individual is represented. The remains were scattered about the feature however and more than one individual likely was present. The sample is comprised chiefly of plastron and carapace fragments although a few limb elements were recovered.

Amphibian

A single non-specific Bufonidae (toad) pelvic element was recovered (.2% of the combined sample). Toads which inhabit the project area today include (Conant 1975: maps 252-271): *Scaphiopus bombifrons* (Plains spadefoot toad), *Bufo woodhousei* (Woodhouse's toad), *Bufo cognatus* (Great Plains toad), and possibly *Bufo americanus* (American toad).

Bird

The avian sample includes 47 elements from three taxa constituting about 7.7% of the combined identified sample. Bird bones are dominated by domestic chicken (76.0%). Thirty-seven chicken bones were recovered representing a minimum of four individuals. This is the highest MNI value for the Fort Ellsworth sample. Twenty-seven bones were recovered from Dugout 13 and five from Dugout 10. Modifications noted on the chicken sample include: burning (4), carnivore chewing (1), and knife marks (7). One specimen is from an immature individual and three are poorly preserved. All of the skeleton is represented but the sample is dominated by leg and wing portions. Breasts and back elements are relatively rare.

Other identified birds include: Galliformes (grouse, prairie chicken, domestic chicken, quail etc.) and Icteridae (meadowlark/blackbird family). The generalized Galliformes material include nine heavily eroded lower leg bones from what appears to be a single individual recovered from Dugout 13. The poor physical condition of these remains prevented a definitive distinction between domestic chicken and one of several similar wild forms. Historic sources indicate Ft. Ellsworth soldiers did hunt prairie chicken. The Icteridae bone is a humerus collected from Dugout 13.

Small Mammal

Eight small or medium-sized mammal taxa were identified. These include: Soricidae (shrew family), *Sylvilagus floridanus* (cottontail rabbit), *Lepus* sp. (jackrabbit), Cricetidae (native mice), *Microtus* sp. (vole), *Rattus* sp. (domestic rat), Carnivora (carnivore), and *Mephitis mephitis* (striped skunk). Combined, these materials represent 12.7% of the identified bone. Of these, 62 elements or 81.0% are cottontail which reflects a minimum number of three individuals. Except for the skunk bones, cut marks or burning were not observed on these materials. A skunk tibia from the Knoll carries knife marks and a femur from Dugout 13 has an entrance and exit wound from what appears to be a single shotgun pellet. Single examples of cottontail and jackrabbit bones have been rodent gnawed.

Nearly all of the cottontail and jackrabbit bones originated within Dugout 10 as did the vole and carnivore bones. Dugout 13 produced the shrew bone, two cottontail bones, one jackrabbit bone, and all of the domestic rat bones. The skunk sample was recovered from Dugout 13 and the Knoll.

Based on contemporary distribution (Cockrum 1952:96-101), the jackrabbit bones could be either *L. californicus* (black-tailed jackrabbit) or *L. townsendii* (white-tailed jackrabbit). Voles in the project area include: *M. ochrogaster* (prairie vole) and *M. pennsylvanicus* (meadow vole) although the former is much more common (Cockrum 1952:201). The rat remains could be either *R. norvegicus* (house or Norway rat) or *R. rattus* (black rat). Today only the former occurs in Kansas but both species could be found in the area during the 19th century (Cockrum 1952:208-210). The two species of shrew which inhabit central Kansas (Cockrum 1952:40-47) are *Blarina brevicauda* (short-tailed shrew) and *Cryptotis parva* (least shrew). The Fort Ellsworth specimen appears to be from the former. The carnivore element is a single tooth fragment which is likely from a small dog or coyote, fox, raccoon, or badger.

Large Mammal

About 72% of the identified sample is large mammal remains. The collection consists of 439 elements representing a minimum of nine individuals assigned to seven taxa. Three hundred and thirty-six bones are identified as *Bos taurus* (cattle). Historic accounts indicate soldiers stationed at Fort Ellsworth hunted bison from time to time. Accordingly, a concerted effort was made to identify any bison remains. Cattle and bison rib, vertebra, and long bone diaphysis fragments are indistinguishable. Others such as long bone articular ends, carpals, and tarsals do have subtle distinguishing characteristics. Despite close examination, bison remains were not identified although the osteological similarity between bison and cattle is subtle and the presence of small amounts of bison can not be confidently eliminated.

Three hundred and fifteen (93.7%) of the cattle bones were recovered from Dugout 13. The remainder originated within Dugout 10 (8 elements), the Knoll (12 elements), and the surface (1 element). Modifications to cattle bones include: burning (34 elements), rodent gnawing (7 elements), carnivore gnawing (72 elements) and butchering marks (160 elements). In addition, 114 specimens are from immature animals and 49 are in fair or poor condition.

Other large mammals identified include *Sus scrofa* (swine), *Odocoileus* sp. (white-tailed or mule deer), *Antilocapra americana* (pronghorn antelope), and *Capra/Ovis* (sheep or goat). These materials are represented by 103 elements and about 80% of those are swine (83 bones). Swine bones are most common from Dugout 13 although a few specimens were collected from Dugout 10. Deer and pronghorn bones were recovered from all major analytic units but in very low frequencies. The single sheep/goat bone was found in Dugout 13.

Characteristics recorded for the swine sample consists of : burning (1), rodent gnawing (3), carnivore gnawing (10), butchering marks (29), immature specimens (58), and poor/fair condition (15). None of the other large mammal bones are burned but six deer and pronghorn

elements carry cut marks, two are gnawed by carnivores, one is from an immature animal, and eight are poorly preserved.

Human Remains

Eleven human bones were identified. The sample consists of two teeth, a fragmented thoracic vertebra, a first rib, and seven hand bones. The human bone was retrieved from various excavation units in the Knoll area. These 11 bones plus 13 other potentially human bones from the Knoll were reexamined by physical anthropologist Dr. Michael Finnegan. His analysis indicates a MNI of one adult of undetermined ancestry (Finnegan, Appendix C).

Discussion

Sample Origin

The overall well preserved nature of the collection suggests bone was rapidly buried following disposal. The vertebrate collection is comprised principally of remains present as a direct result of human subsistence activity. Large domestic mammals make up nearly 70% of the sample by number and 96.6% by bone weight. Other taxa which are linked to dietary activities include: chicken (including eggshell), deer, and pronghorn. At least one skunk bone exhibits evidence of hunting although contribution to the diet is problematic. The rat bones are certainly related to human occupation but it is very unlikely they relate to subsistence pursuits. Most of the recovered subsistence sample was retrieved from intentionally placed refuse deposits. Other species which may have been subsistence items include: gar, turtle, rabbit, jackrabbit, and carnivore although direct evidence such as burning and butchering marks were not observed. It is also possible some of these taxa died naturally at the site or were introduced by carnivores. The occurrence of toad, perching bird, shrew, and vole is even more likely a function of natural processes. The bulk of the sample is affiliated with the mid 19th century occupation of Fort Ellsworth, however a Native American (Central Plains tradition) component was also discovered at the site area. Deer, pronghorn, rabbit, gar, turtle, skunk, mussel shell, and carnivore have all been documented from Central Plains tradition hamlets (Wedel 1986; Bozell 1991; Koch 1995) and some of the Fort Ellsworth remains could be linked to this prehistoric occupation.

The distribution of fauna is consistent with functional interpretations of Fort Ellsworth proveniences. The bulk of the bone originated within Dugout 13 which is the ruins of a living quarters. Dense bone deposits in and around the feature would be expected in such a setting. It is noteworthy however that some of the Dugout 13 fauna was retrieved from stratigraphic levels above the "floor" of the quarters. This situation may indicate a portion of the sample was deposited as refuse from other locations at Locality 6 following abandonment and collapse of this dugout (See Ziegler, Chapter 3 for a discussion of this possibility). Dugout 10 is a bakery. Obvious subsistence items include small amounts of chicken, swine, cattle, and possibly pronghorn bones. The low frequency of these remains is consistent with occasional consumption of meals by bakers at work. The majority of the cottontail and jackrabbit bones were recovered from the bakery but their relationship to the diet of people working in the structure is unclear.

The composition of the Knoll fauna is rather similar to Dugout 10 and characterized by a few cattle, deer, and pronghorn elements -- again possibly related to occasional meals consumed by soldiers working in and around the structure.

Ziegler (Chapter 3) discusses the origin of the human remains on the Knoll. He points to several lines of evidence that suggest they are the remains of soldiers.

Native and Domestic Fauna

Based on the present investigations, Fort Ellsworth occupants overwhelmingly relied on domestic animals for meat. The faunal profile is typical of Euroamerican military, urban and rural contexts with over 70% of the identified specimens attributed to domestic forms. These bones reflect animals that were either raised on-site or arrived as butchered and processed meat (Eakins 1924). The fort was strategically located at the juncture of two important transportation and supply routes enabling soldiers garrisoned there to have ready access to meat and other goods. Native fauna such as deer, pronghorn and perhaps rabbits and gar reflect limited hunting and fishing activities by Fort Ellsworth soldiers in the immediate vicinity of the post.

The absence of positively identified bison bone is somewhat curious. Fort Ellsworth soldiers hunting buffalo and other mammals and birds is well documented archivally (Baer 1996:11,43). Although these activities are frequently mentioned in historical documents, the comments typically refer to hunting while on patrol or escort duty away from the fort. Consequently, while a significant portion of protein may have been supplied by hunting, much of the game was killed, butchered and consumed in the field with little bone and meat returned to the post. This may be particularly true of bison. With apparently ample supplies of beef, pork and other food available at the fort, perhaps there was little incentive for soldiers in the field to make a regular and concerted effort to return wild game from the field, particularly large bulky buffalo portions. Also, only a small portion of Fort Ellsworth was excavated and other unexcavated features may contain larger and more diverse assemblages of wild game remains.

Butchering and Cuts of Meat Represented

This discussion defines swine and cattle carcass reduction patterns practiced at Fort Ellsworth and at butchering facilities supplying the post. The location of butchering marks was noted during identification and they are dominated by saw and cleaver marks but occasional knife cuts were observed (Figure 5.2). Knife marks are more common on swine remains and sawn and chopped elements more frequent within the cattle sample. Gust (1983) noted a similar pattern within California urban faunas and attributed the pattern to the relative thickness and hardness of cattle bones in comparison to swine. Heavily crushed diaphysis shafts are frequent among Fort Ellsworth bovid and swine remains. Smashed diaphyses are also common in frontier Euroamerican samples such as trading posts and early homesteads -- a pattern likely related to marrow extraction. Meat processing by the U.S. Army sought to maximize yields. Not only did

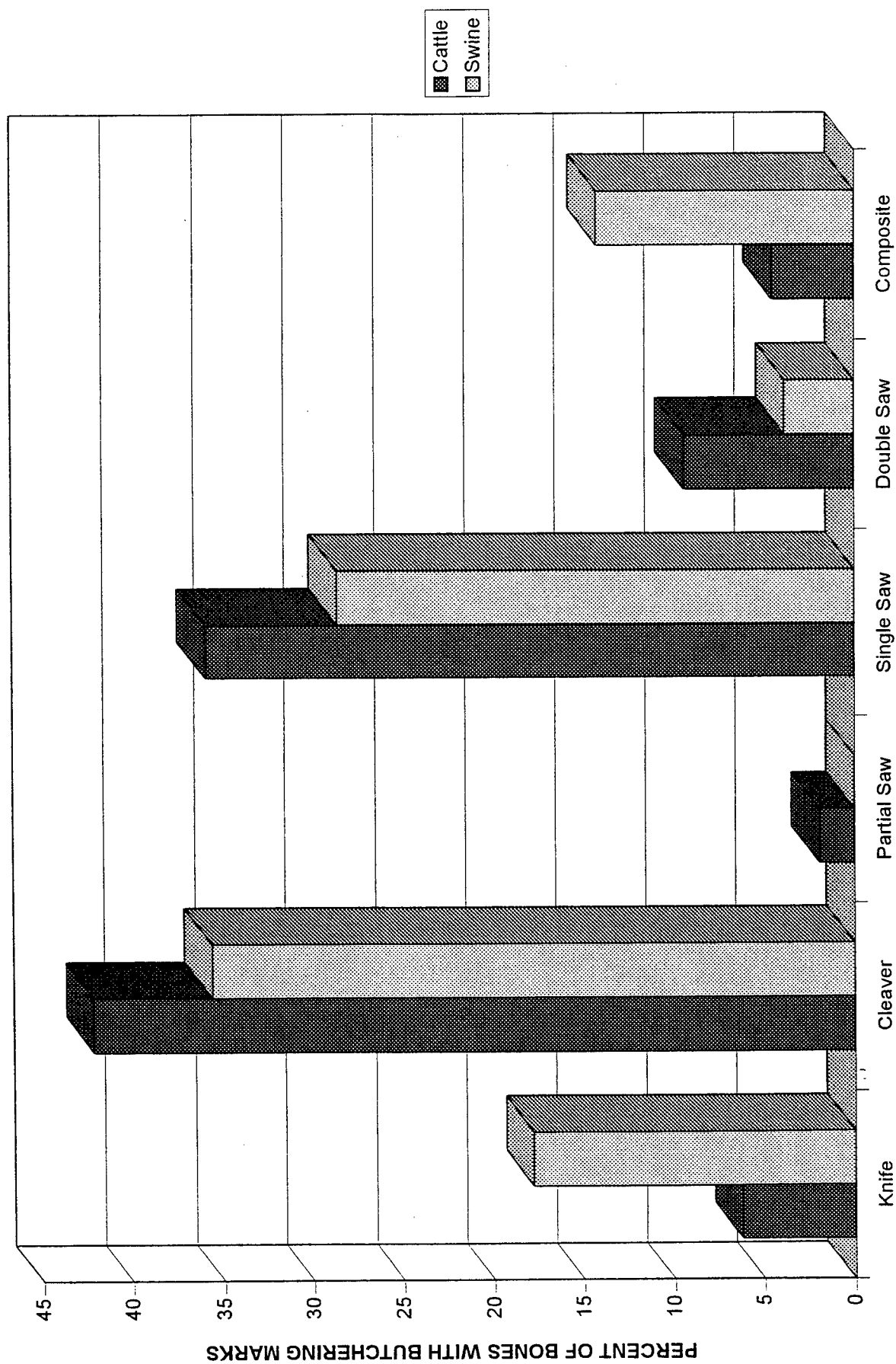


Figure 5.2. Percent of cattle and swine bones with butchering marks.

carcasses produce meat but bone was cooked to extract oil, tallow, and grease (Eakins 1924:112-114).

The frequency of butchered swine bones (34%) is not significantly lower than cattle (48%). For both, the most common butchering marks are left by cleavers and saws through one end of ribs, long bones and vertebra. Elements sawn on both ends are significantly less frequent for both species. Tables 5.7 and 5.8 cross-tabulate skeletal portion against cut type. The most frequent swine sawing is observed on vertebrae and a few long bones. Ribs and most long bones display knife and cleaver marks. These values are consistent with standard military butchering practices of first dividing the hog carcass in half with a saw along the belly and vertebra axis. This is referred to as "packer dressing" and was typically performed at packing houses prior to shipment. Further carcass reduction was also done at packing houses using smaller tools. Over 80% of pork was smoked or salted before shipment to field posts (Eakins 1924:204). Most secondary post butchering was completed with knives, axes, and cleavers (Eakins 1924:194, 195, 204-214). Even as early as the 1820s, a significant portion of military pork products on the central Plains was barreled (Bozell 1997).

Table 5.7. Inventory of Butchering Marks Recorded on Fort Ellsworth Swine Bones.

ELEMENT	Knife	Cleaver	Single Saw	Double Saw	Composite
Mandible	0	0	0	0	1
Cervical	0	0	0	0	0
Thoracic	0	0	4	0	0
Lumbar	0	3	3	1	1
Sacrum	0	0	0	0	0
Rib	3	4	1	0	2
Scapula	0	1	0	0	0
Humerus	1	0	1	0	0
Pelvis	0	1	0	0	0
Femur	1	0	0	0	0
Tibia	0	0	0	0	0
Fibula	0	1	0	0	0
Metapodial	0	0	0	0	0
Digit	0	0	0	0	0
TOTAL	5	10	9	1	4

Table 5.8. Inventory of Butchering Marks Recorded on Fort Ellsworth Cattle Bones.

ELEMENT	Knife	Cleaver	Partial Saw	Single Saw	Double Saw	Composite
Atlas	0	1	0	0	0	0
Axis	0	1	0	0	0	0
Cervical	0	8	0	1	0	0
Thoracic	0	15	0	0	0	0
Lumbar	3	20	0	10	0	0
Sacrum	0	1	0	0	0	0
Costal	0	0	0	0	0	0
Sternebra	0	0	0	0	0	0
Rib	6	10	3	29	7	6
Scapula	0	1	0	2	1	0
Humerus	0	2	0	1	1	0
Ulna	0	2	0	3	0	1
Radius	0	3	0	3	0	0
Radius/Ulna	0	0	0	0	0	0
Carpal	0	0	0	1	0	0
Pelvis	0	2	0	2	6	0
Femur	0	1	0	3	0	0
Patella	0	0	0	0	0	0
Tibia	0	0	0	3	0	0
Tarsal	1	0	0	0	0	0
Digit	0	0	0	0	0	0
TOTAL	10	67	3	58	15	7

A wider variety of cattle bones are seen than are swine bones. Ribs are the most often seen but saw marks were also regularly recorded on vertebrae and limb elements. Knife marks are fairly rare on the cattle sample but cleaver or other chop marks occur frequently on ribs, vertebrae and some long bones. When beef was shipped to outposts, it was minimally quartered with saws. Beef may also have been processed into secondary divisions such as ribs, foreshank, brisket, and hindshank (Eakins 1924:130-147). Frontier army posts typically maintained cattle herds in addition to partially processed meat arriving overland or, after the 1860s, by rail. Thus even primary slaughtering and initial processing were likely done on-site. Much of the secondary butchering on the Fort Ellsworth cattle sample appears to have been done with heavy cleavers when separating flank and brisket from ribs. Ribs, which are common at Fort Ellsworth, were most often processed with saws.

Meat cut categories were established from a variety of U.S. Department of Agriculture manuals and historic-era zooarchaeological research project sources (Eakins 1924; Hurlburt 1977; USDA 1977, 1983; Levie 1979). Generally, the higher grades are represented by lumbar and thoracic vertebrae, medial ribs, pelvis, scapulae and upper limb bones. Lower value cuts are reflected by lower leg, neck and cranial elements. Sample frequencies were segregated into major meat cut portions for swine and cattle (Figures 5.3 and 5.4 respectively). The swine sample indicates a distinct preference (or availability) for high grade pork roasts and chops with lesser amounts of hams, ribs, bacon, and stews. Despite this, all major cuts are represented at some level.

Thirteen beef cuts are reflected in the Fort Ellsworth cattle sample. The most frequent are bones reflecting short loin, short ribs, chuck roast, foreshank, rib roast, sirloin, and tenderloin. Lesser amounts of the following cuts are represented: arm, hindshank, neck stews, beef round, rump roast, and short plate. The cattle sample was also divided on a scale based on ten meat value ranks (Figure 5.5) defined by Huelsbeck (1991). Rank 1 is the highest value and Rank 10 the lowest. The most common cuts include: short loin and ribs (high value cuts), chuck roast and short ribs (mid-level cuts) and stew and shank portions (low value cuts). The poorest represented cuts include round and rump roast, brisket, and head and feet portions.

Whether cattle and swine were raised and processed in or along the margins of Fort Ellsworth or imported from some distance, can not be determined with available data. Small slaughterhouses and feed lots often supplied western military posts. Feed lots sold livestock to the military or butcher shops and the meat further processed for soldiers. Much of the swine sample is brittle and slightly discolored suggestive of materials which have been salted or smoked prior to shipment. The cuts of domestic meat indicate soldiers at Fort Ellsworth enjoyed a diverse assortment of beef and pork (as well as chicken) dishes. They certainly were not restricted to a consistent diet of low quality cuts. This situation further indicates the post was well supplied with either livestock or a wide variety of processed meats.

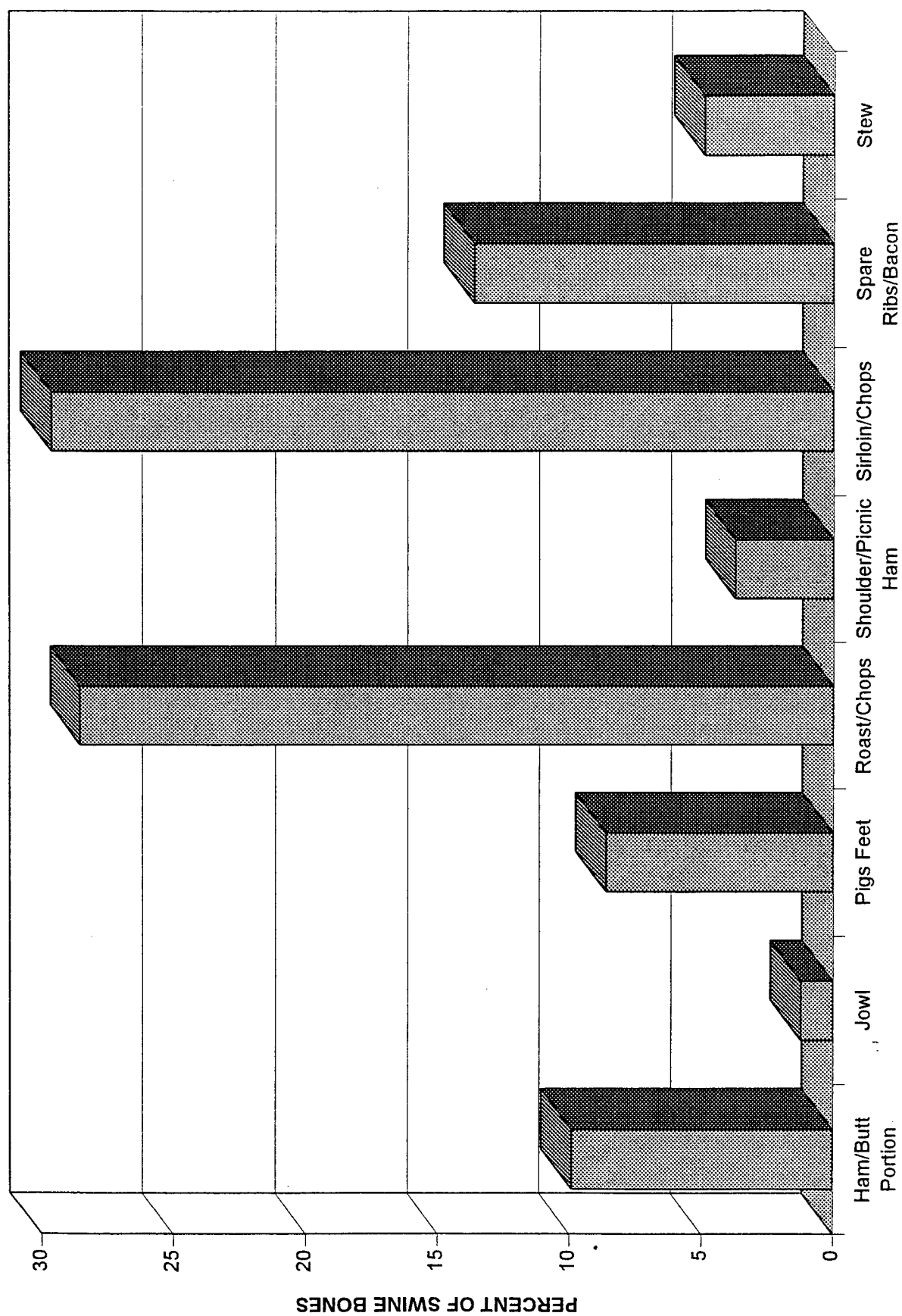


Figure 5.3. Major meat cuts reflected by swine bones.

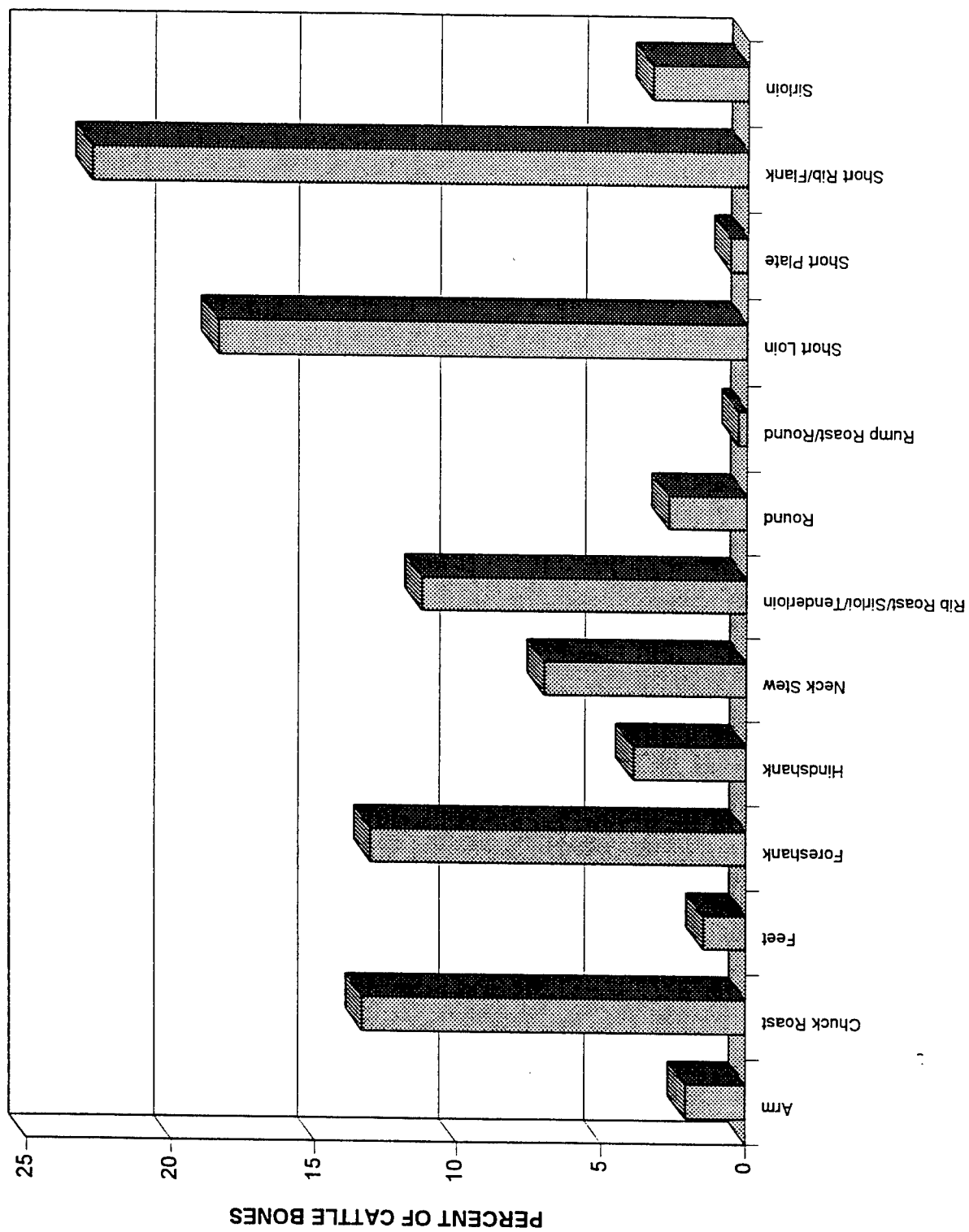


Figure 5.4. Major meat cuts reflected by cattle bones.



Figure 5.5. Food value rank for identified beef remains.

External Comparisons

The sample is adequate to offer impressions of the Fort Ellsworth meat diet in broader historical context. The sample was cross-tabulated against six other central Great Plains military and civilian Euroamerican assemblages (Figure 5.6) including: Fort Manuel (South Dakota fur trade post [1812-1813]; Mundell 1981), Fort Atkinson (eastern Nebraska military post [1820-1827]; Mundell 1979), Fontenelle's Post (eastern Nebraska fur trade post [1820-1840]; Bozell 1997), Fort Scott (southeastern Kansas military post [1840s and 1850s]; Reynolds 1983), Rock Creek Station (southeastern Nebraska stage station [1860s]; notes in possession of the author), and Lead (western South Dakota mining town [1876-1930]; Bozell 1996). A distinct, yet rather predictable, pattern emerges. The earliest Euroamerican settlements in the region like Fort Manuel were supported almost entirely by procurement of wild game -- particularly large mammals. The introduction of chickens, swine, and cattle began in the 1820s at both military and civilian establishments throughout the region, however the intensity of domestic subsistence use varied rather sharply between military and civilian sites. By the 1820s, nearly 50% of the fauna from Fort Atkinson was from domestic animals. The trend toward increasing domestic animal use continued steadily for the military sites and by the time Fort Ellsworth was occupied in the 1860s nearly 75% of the fauna is from domestic animals. cursory examination of faunal samples from 1890s features at Fort Robinson in northwest Nebraska revealed domestic bone portions at over 90%.

The civilian sites also indicate significant reliance on domestic animals but the adoption of the strategy was slower than it was for the military. Fontenelle's trading post was occupied at least a decade after Fort Atkinson but has nearly 25% less domestic fauna. Forts Scott and Ellsworth have 60-75% domestic fauna but Rock Creek Station (1860s Oregon Trail road ranch) produced only 50% domestic fauna. It was really not until *after* the frontier period that civilian sites produce domestic faunal profiles similar to military posts. For example features from very late 19th century Fort Robinson and South Dakota Black Hills mining towns such as Lead yield faunas with over 80% domestic fauna. By the 1870s, the character of Euroamerican subsistence in the central Plains had shifted dramatically from a hunting based economy to a market economy. This change took place within the span of about a generation -- from 1850-1880 -- and the military implemented these shifts before pioneers and fur traders.

Summary and Conclusions

The faunal assemblage recovered from archaeological investigations at Fort Ellsworth consists of over 3500 bone and shell fragments and about 2500 eggshell fragments retrieved from a variety of proveniences including building ruins and midden deposits. Over 600 pieces were identified to a taxonomic grouping at the family level or below. The identified fraction is dominated by cattle, swine, and chicken with reduced amounts of deer, small mammals, mussel shell, fish, and birds. The sample is well preserved and the portion which could be identified is high. There is little reason to suspect a significant portion of the fauna deposited at Fort Ellsworth has decayed away. Some erosion, rodent gnawing, and carnivore gnawing was

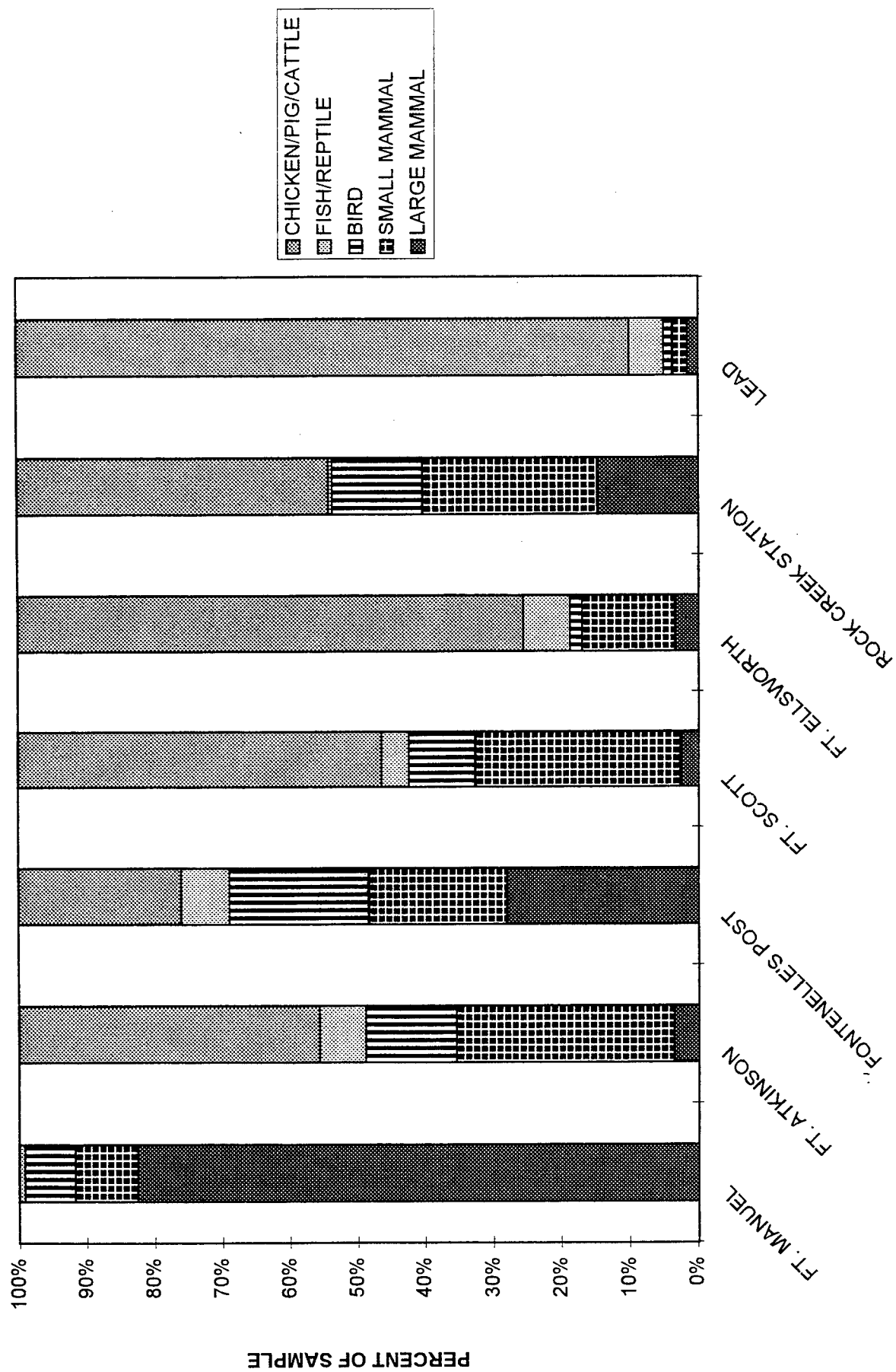


Figure 5.6. Comparison of major taxonomic classes from Fort Ellsworth and select other sites.

observed but these factors did not seriously affect the ability to identify and interpret the sample. Other than eggshell, flotation processing did not produce a significant amount of faunal material.

The large domestic mammal meat portion of the diet included a variety of high, medium, and low value cuts dominated by beef with smaller amounts of pork. Preferred portions include beef ribs, roasts, loins, and flanks and pork ribs, roasts, and chops. Poultry and eggs were also consumed with some regularity. Evidence of wild game procurement is limited although deer, pronghorn, rabbit, fish, and turtles occasionally added a little variety to the diet. Historic accounts clearly document hunting wild game by Fort Ellsworth soldiers although much of the bone debris from these activities may have been left at field camps and kill sites.

Documents relating to military subsistence suggest many posts were regularly supplied with partially or partially processed meats – beef, pork, and chicken – as well as a variety of other foodstuffs. Fort Ellsworth was situated on a major supply route and a significant amount of meat likely arrived at the post partially butchered and much of it was probably barreled. Post personnel probably further butchered imported meats for individual rations. In June of 1866 a private stationed at Fort Ellsworth was detailed as a butcher in the commissary department (NA 1865-1869: Special Orders No. 69, 19 June 1866). The post also apparently maintained livestock. Archival documentation is scant regarding on-site livestock however an 1867 post inspection noted that “The Beef cattle at the Post are very thin, there is much complaint made as to the quality of the Beef” (NA 1865-1869: E Otis to J. Davidson, 10 January 1867).

Butchering marks observed on cattle and swine remains were left by knives, cleavers (or other chopping tools), and saws. A high proportion of cattle bones were modified by saws and cleavers. Swine materials more often exhibit knife marks although they too display saw and cleaver marks. A significant portion of the sample is small crushed diaphysis splinters suggesting cattle and swine were also processed for production of grease, oil, and tallow. Bone processing offers further suggestion some stock was raised and processed on site.

Over 90% of the unidentifiable debris and 78% of the identified elements were recovered from Dugout 13 – a dugout identified as a living quarters. Small amounts of bone were recovered from Dugout 10 (a bakery) and the Knoll. The only remains which do not occur with regularity in Dugout 13 are mussel shell fragments and human bone. These materials were recovered primarily from the Knoll area which also is the location of a Central Plains tradition component. This prehistoric Native American occupation may be the source of the shell remains. Ziegler (Chapter 3) has made a case for the human remains on the Knoll being those of soldiers.

The Fort Ellsworth fauna is consistent with 19th century American West vertebrate procurement patterns. The Fort Ellsworth diet, dominated by beef with lesser amounts of pork, chicken and wild game, is similar to that recorded for military and post-settlement civilian sites throughout the central Great Plains. Such a pattern is in rather sharp contrast to fur trade and early pioneer sites of only a generation earlier whose inhabitants were squarely focused on broad spectrum hunting.

Fort Ellsworth fauna adds to a growing body of data regarding the military economy of the central Great Plains. Several avenues of further research are evident in the event additional structures are excavated. Samples from other dugouts would have the potential to identify variability in hunting, butchering, and dietary patterns across functional and military rank lines. For example, faunal remains have the potential to identify differential diets between officers and enlisted men. Similar data could be gathered for proveniences associated with civilians. Needless to say, sampling any off-post camps would be very useful in determining the character of wild game procurement. Further assessment of historic documents, particularly those relating to food inventories and shipment, in light of the faunal study would be productive.

The interface between history and historical archaeology has not always been a fruitful one and practitioners have expressed dissatisfaction with the apparent lack of recognition of the potential archeologists and historian have by sharing methodological approaches and data with one another. How this problem developed and has persisted is not difficult to understand. Archaeological and historical data are much different breeds of information and often can lead to incongruous interpretations.

Interpretation of fur trade, military, pioneer, and urban subsistence systems have not been spared although concerted efforts to meld the two types of data together into coherent statements have been attempted. In some instances, historical documentation has corresponded remarkably well with zooarchaeological data, yet this is not always the case. The utility of using both types of information is that they serve to verify and augment one another and provide a basis for interpretation refinement.

Historical documentation regarding the present study provides a general characterization of subsistence patterns. Statements by soldiers, civilians, and visitors to the post offer insight into the several major patterns in operation during the occupation such as raising and importation of domestic stock and hunting. The archaeological data does not come into serious conflict with historical documentation but taken together they enhance detail. For example, we know domestic meat played a major role in the post diet but the archaeological information was required to determine what types of cuts were being eaten and processing strategies. The character of the faunal assemblage has also aided in functional definition of excavated features. The sample is entirely consistent with the assumption of the two major excavated areas being a quarters and a bakery. The faunal analysis does fall short in determining the role of hunting wild game. The small sample of native species recovered probably inaccurately reflects the level of hunting done by soldiers stationed at Fort Ellsworth. The magnitude of hunting carried out by Fort Ellsworth personnel remains perhaps the most important unresolved subsistence related research question.

CHAPTER 6

ARCHAEOBOTANICAL REMAINS

by
Mary J. Adair

Introduction

During the 1995 and 1996 excavations, flotation samples were systematically taken from all areas of the site investigated. This included Dugout 10, identified as the bakehouse; Dugout 13, believed to have been a residence; the knoll area, which was the location of several prehistoric and historic activities; and the flats area, a location above the dugout depressions. A total of 29 flotation samples were analyzed from these proveniences in an attempt to learn more about the diet of the Fort Ellsworth residents. Although historical records provide information on the Army's food supplies that were available to the residents, gathering wild plant foods and gardening were also potential sources, which are not clearly identified in the records. Plant remains recovered from flotation samples could therefore provide additional information on the strategies employed by residents of early historic western forts, and when combined with other assemblages, document the multiple choices available in providing fresh, dried, or canned and processed foods.

Methodology

Three flotation samples collected from the 1995 excavations were each approximately 5 gallons and were collected from Feature 3, Dugout 13. Additional samples were taken in 1996 when more extensive excavations focused on several areas of the site. These samples were smaller, measuring approximately 2 gallons. Twenty-six samples from the 1996 investigations were pre-selected for analysis based on their provenience. Despite the differences in flotation sample size, all samples were processed and analyzed in the same manner. Samples were processed in the field, using a SMAP barrel flotation device with a heavy screen retention of 1/16 inch and a light screen retention of 425 μm . (0.0167"). The light fraction residue was then processed through a series of graduated sieves, dividing the sample into 4 size grades: all remains equal to or larger than 2 mm; remains between 2 mm and 1 mm; remains between 1 mm and .5 mm; and all material less than .5 mm in size. All sized samples were then sorted with the use of a binocular microscope. No sub-sampling or time constraints were imposed. Identifications were made with the use of a comparative collection and published manuals. Recovered plant remains, including modern, uncharred and charred, are listed in Table 6.1.

Plant remains normally disintegrate in soils unless they are charred or deposited in an anaerobic environment, such as desiccated or waterlogged contexts. Various studies, however, have demonstrated that seeds can remain intact, and even viable, for hundreds of years in prairie soils or less than ideal contexts. The presence of uncharred seeds in several flotation samples therefore required special attention to determine whether they represented modern seed

Table 6.1. Identified Archaeobotanical Remains, 14EW26, Fort Ellsworth

Scientific Name	Common Name
Amelanchier sp.	Juneberry or serviceberry
Amaranthus sp.	Pigweed
Argemone sp.	poppy
Chenopodium sp.	goosefoot, lambsquarters
Cucurbita sp.	Pumpkin shell
Euphorbia sp.	spurge
Helianthus sp.	sunflower
Iva xanifolia	marshelder
Galium sp.	bedstraw
Portulaca sp.	purslane
Prunus sp.	Plum or cherry
Zea mays	corn
Unidentified nutshell	
Unidentified grass	

rain or deposits made during the occupation of the fort. The presence of modern seeds in soils is not unusual, given the dispersal pattern of many weedy plants and the burrowing habits of insects and small rodents. On the other hand, it is quite possible for seeds to have survived the approximate 130 year deposition without being charred, if the contexts were undisturbed and if the seeds displayed signs of long term deposition. The uncharred seeds recovered from the Fort Ellsworth samples were determined to represent modern deposits however, since many still exhibited delicate elements such as outer pericarps, awns, and glumes, which would erode or disintegrate over time. Additionally, most of the uncharred seeds were recovered from the upper levels and were identified as the more common weedy annuals (i.e. *Chenopodium* sp., *Amaranthus* sp., *Euphorbia* sp. and *Portulaca* sp.) found in the area today. Nine features examined contained only modern seeds. This included Features 107, 112, 114, 115, 120, 122, 134, 139, and 144. Only one sample from each feature was processed.

An identification and quantification of the charred remains is presented in Table 6.2. A description of each of these taxa, determined to be associated with the mid-19th century occupation at the site, is presented below. Site context is also provided, as is any historical documentation on the use of the plant. Historical documentation comes from several sources, including numerous letters and accounts from individual travelers, military records available at the National Archives, the memoirs of Alice Blackwood Baldwin, wife of Lieutenant Baldwin, an officer stationed at Fort Ellsworth. This documentation is extremely valuable in determining the potential selection for native or wild plant foods and in providing an evaluation for the specific remains recovered.

Table 6.2 Distribution of Archaeobotanical Remains, Fort Ellsworth

Taxa	Dugout 10										Dugout 13					Flats	Knoll	TOTAL
	F119	F124	F142	F145	F148	F106	F111	F129	F141	F147	F4	N440,E502	N444,E508					
Samples	1	1	1	1	1	1	1	1	3	1	1	3	1	1	1			
Amelanchier								5			10*					19		
Amaranthus																5		
Argemone											1					10*		
Chenopodium	2		1*			1	1	4	2*	2*	5*					1		
Cucurbita		1cf	1													7,10*		
Euphorbia			2*			4*			1*							2		
Helianthus								1	1*	1						7*		
Iva xanifolia																2,1*		
Galium				4		1*						5*				5*		
Portulaca						1				1*		3*				4,4*		
Prunus					11			3				3*				1,4*		
Rumex		1						1	1*							14		
Zea mays	2		1					3						1	1	2,1*		
nutshell	1		2													7		
gramineae					1	3						9*		1		3		
unknown	2		3		2	1		7		1			5	2		5,9*		
																30		

* uncharred

Identifications

Amelanchier sp. (June-berry, service-berry)

One species of this plant, *Amelanchier arborea*, is native to Kansas and is found primarily in the northeast and southeast sections of the state. Its habitat is rocky hillsides or slopes where it is found with other trees. The plant is described as a tall shrub or a small tree, occasionally growing to 8 meters in height (Stephens 1969). Fruits mature in clusters and ripen in June.

The five June-berry seeds were recovered from Dugout 13, Feature 129, which was identified as a burned stone or firebox-cleaning complex. Their association with several other charred remains suggests that they represent deliberate gathering practices rather than accidental inclusion and charring. Since the species is not very abundant in the area, the likelihood of these seeds being deposited by non-human factors is quite limited.

Argemone sp. (prickly poppy)

The prickly poppy is not a common species in eastern Kansas today, but is more abundant in the western and central sandy regions and surrounding states. Adventive species in the eastern parts of the state include *A. albiflora*, also identified for northwestern Missouri (Steyermark 1963), and *A. polyanthemos* (Great Plains Flora Association 1986). Both species are found in pastures, roadsides and abandoned farm fields. The prickly poppy is described as an annual or biennial, reproduced by seeds, which mature in July or August. A single seed was recovered from Feature 147 (a post mold) in Dugout 13.

Chenopodium sp. (goosefoot, lambsquarters)

A common annual herb, seeds of this species have been identified in archaeobotanical assemblages in the Central Plains dating from the Archaic to the historic period. At least 9 species are native to eastern Kansas, making it one of the more common weedy annuals found in a variety of habitats, ranging from disturbed soils to prairie sloughs (Bare 1979). Both charred and uncharred goosefoot seeds were recovered from various contexts at Fort Ellsworth. The use of goosefoot, along with wild garlic or onion, is noted as being used in the preparation of meals, presumably as a seasoning. The reference to goosefoot is however, not complete enough to determine whether the reference is to the tender young leaves of the spring or the ripe mature seeds of the late summer and autumn.

Cucurbita sp. (gourd, pumpkin)

Two small shell fragments were identified as belonging to the cucurbit family. Only one species of this family, *Cucurbita foetidissima*, is native to Kansas where it is found in rocky or sandy soils, disturbed areas, along railroads, and in waste ground. The fruits mature from June to mid-August but are considered inedible. The plant itself emits a noticeable ill-smelling odor, especially if the leaves are crushed. While the dried fruit could have been collected and used as a container, the shell fragments could also represent a domesticated squash variety grown in fort gardens, purchased from area farms, or supplied by the sutler's store. With only two small fragments however, the exact species could not be identified.

Helianthus sp. (sunflower)

Several species of this plant are native to eastern Kansas, including the common sunflower (*Helianthus annuus*) and the Jerusalem artichoke (*H. tuberosus*). Identified as either annual or perennial, this species produces edible seeds borne in disks maturing from early August through the first frost. It is found in a variety of habitats, ranging from dry, open areas to open wooded regions. Two charred and one fresh seed were recovered from Dugout 13.

Galium sp. (bedstraw, cleavers)

Bare (1979) identifies 5 varieties of *Galium* common to the eastern and northeastern sections of Kansas. Most species are found in prairie ravines, shaded areas, under thickets and shrubbery and in woodlands. When the mature fruits of *G. aparine* are dried and roasted, they yield a coffee-like beverage. Other species are reportedly used for dye (roots) or for a beverage (leaves). Four charred seeds were recovered from Feature 145 in Dugout 10.

Portulaca sp. (purslane)

Of the three species found today in Kansas, only *P. mundula*, is native to the area (Bare 1979). This succulent annual is found in moist sandy soils, sometimes in shallow soil over limestone. While no information is available on the use of mature seeds of this species, seeds of the *P. oleracea* have a long history of use in Europe and Asia where they are grown as a garden vegetable. The herbage of purslane may be used in fresh salads, as a cooked green vegetable, or for pickling, while the seeds may be ground and used for flour or cooked as mush. Most of the purslane seeds recovered from Fort Ellsworth were modern; only one charred seed was recovered from Feature 111 in Dugout 13.

Prunus sp. (plum, cherry)

The four native species of this plant produce juicy, sweet, edible fruit from June through August (Stephens 1969). The wild plum, *P. americana*, is the more common species and is found in pastures, along roadsides, and at the margins of woods. While many wild animals favor the fruit, the wood of the black cherry (*P. serotina*) has historically been selected for the manufacture of furniture, wall panels, and musical instruments. Fragments of *Prunus* fruit stones were one of the more abundant taxa identified from the Fort Ellsworth samples. Eleven fragments were recovered from Feature 148 (the ash or fire box in Dugout 10) while three fragments were associated with Feature 129 in Dugout 13. It is difficult to know whether these pits represent a local wild resource or remains from a canned or bottled item since it was common to process fruits without first pitting them.

Rumex sp. (dock)

One charred seed of this taxa was recovered from Feature 124, Dugout 10 and Feature 129, Dugout 13. The Great Plains Flora Association (1986) lists 7 species as native to eastern Kansas where they are found primarily in pastures, prairies, and alluvial soils. Historical reference of the use of dock (*Rumex* sp.) comes from the memoirs of Private Solon True, a soldier on the Santa Fe trail in 1864 to 1865. Having no rations and unsuccessful in hunting, True and several others gathered dock or sorrel leaves and boiled them. True was apparently unaware that several of the native species of this plant are quite bitter and often require long

boiling and rinsing to make them palatable. His reference to being sick for some time was certainly a learning experience.

Zea mays (corn)

Six fragments were identified as kernels of corn, *Zea mays*. As a domesticated plant, the presence of this taxa suggests that the residents either grew the crop or acquired it from some other source. The presence of corn may also point to the use of this for livestock feed. However, hay was apparently a common livestock feed, as records describe a fire in 1866 that destroyed over 70 tons of government hay stacks.

Grass

Unidentified grass seeds were recovered from both Dugouts 10 and 13, some fragments displaying characteristics similar to wheat. As discussed below, Fort Ellsworth maintained a bakery where bread was prepared daily. The presence of wheat seeds would therefore not be surprising. Other grasses, native to the area, could have also been selected and used for the manufacture of brooms, stuffing for cushions or bedding, or kindling for the fire. The likelihood of grass seeds in the archaeobotanical assemblage is therefore high.

Wood

Wood charcoal was recovered in varying quantities from the flotation samples. While most of it was small fragments, several pieces were large enough to be identified. Feature 125 is burned wood recovered in a sandy loam just above the floor of Dugout 10. It is not interpreted as flooring or a post. Examination of several of the larger pieces from this feature revealed that the wood was from a diffuse porous tree, indicating that it came from a species that produced a measurable growth during both the spring and summer months. Samples examined compared most favorably to that of *Celtis*, or hackberry, a dominant species found along the Smoky Hill or Spring Creek floodplains.

Feature 2 is a piece of planking excavated from the knoll area in 1995. It is not burned or even charred. Examination of several transverse sections of this wood indicated the absence of vessels, or specialized cells responsible for conducting water and dissolves salts. This is highly characteristic of softwoods, which conduct water instead through trachids (Pearsall 1989). Consultation of published reference guides (Minnis 1987) and comparative samples further suggested that Feature 2 could be identified as juniper. Red cedar (*Juniperus virginiana*) is common on the limestone bluffs of east central Kansas. It is usually found in open areas but was planted historically around farms as a windbreak. The wood is durable and was often used for fence posts.

Interpretations

Plant foods were available to the residents of Fort Ellsworth from five potential sources, although they were not necessarily mutually exclusive. Sources include the fort commissary, the fort sutler, fort gardens, area settlers, and wild resources. Historically, most of the food is recorded as being supplied through the fort commissary. Wagonloads were sent from

Leavenworth, Salina, Junction City and often included much more than plant food items. Commissary items at Fort Harker in 1870 include approximately 50 different foods or food categories, including beef and pork, either canned or dried; canned fish; several varieties of coffee and tea; staples such as flour, sugar, and spices; a variety of either canned or dried fruits and vegetables; assorted jams and preserves; and grains such as rice and hominy. Alice Baldwin describes the commissary as always being well stocked in a variety of foods. She also offers some precise information when she describes a breakfast as consisting of fried bacon and apples, stewed peaches and a concoction flavored with onions...butterless toast of soldier's bread and coffee. In addition mention is made of cove-oyster patties, broiled steaks, fried ham, baked potatoes, and stewed tomatoes. Many of the commissary items and many described by Baldwin however, would not leave a record in the archaeobotanical assemblage, but might instead be identified by the remains of their container.

The local merchant, or sutler, was another source for foods and at times may have provided some competition to the commissary. Items listed as available from the sutler included a variety of canned goods and staple supplies. Those that could potentially leave an archaeobotanical record are again limited. As with the canned fruits and vegetables from the commissary, it is assumed that most produce was canned complete with seeds or pits, such that the tomatoes and peaches could be identified archaeologically. Garden seeds were available from the sutler, suggesting that the post kept a garden for either the officers, enlisted men, the post bakery, or the wives. The variety of seeds available however, is not documented, so we cannot be assured that we are dealing with vegetable gardens rather than flower gardens. Information on the crops grown in the fort gardens at Fort Harker is limited to corn, radishes, okra, beans, and lettuce. The maintenance of a fort garden may have been inspired by both the desire for fresh produce and the need to supplement the diet with essential nutrients and vitamins lacking from the daily ration of canned or dried foods. A review of a typical military diet indicates a heavy reliance on fried meat, bread, potatoes, and coffee. Canned or dried fruits and vegetables must have been a welcomed culinary relief from an otherwise boring diet. The addition of canned tomatoes in particular helped to alleviate scurvy as a major problem at western forts. Fresh produce also helped alleviate shortages due to spoilage. Many items provided by the commissary and sutler became rancid or spoiled before they reached Fort Ellsworth. Spoilage at the fort often occurred due to improper storage, as the dugouts provided little protection against an invasion of rodents, worms, or insects, particularly during certain times of the year.

At some posts it was common to have a wagon make a regular trip to the nearest town for extra supplies or for local farmers to regularly supply fresh produce, although such cases have not been documented at Fort Ellsworth. Farms in the area are not mentioned in any historical record until after 1867 when the fort location moved north. However, there still exists a possibility for settlement claims to be made in the area. Several years prior to the construction of the Fort, Joseph Lehman and Daniel Page established their claim in the same area on the Smoky Hill River. Although these men were primarily hunters, supplying pelts and hides to the growing eastern markets, they also reportedly engaged in farming, operated a store, and were designated a stage company for the delivery of mail. This latter responsibility required them to feed the drivers and passengers and take care of the mules. Items listed for sale in the store,

which probably also served to feed the stage company, included corn, onions, radishes, cabbage, potatoes, sweet corn, and beans. Records also described crops of corn and wheat as being grown in the river bottoms. While we may assume that Page and Lehman operated a successful and profitable business, the success of their farming endeavors may have been seriously impaired, as drought and grasshopper plagues are recorded for the area in the early 1860s. Page and Lehman abandoned their claim in 1864 due to repeated Indian attacks, several months before the fort was commissioned.

The likelihood of food remains being deposited in the dugouts is relatively high. Many of the dugouts were used as a residence by both the officers and the enlisted men. One dugout served as the bakehouse. Enlisted men prepared their meals in their dugouts; having been supplied a daily ration, as fixed by Army regulation. To this they could supplement bread from the fort's bakery, wild game, or wild plant foods. Officers and their families were subject to eating the same food as the enlisted men. While some of the officers dined in the blockhouse, those that were married apparently ate at home in the dugout, on meals prepared their wives. Mrs. Baldwin makes several references to hosting dinner parties or attending similar functions at other officer's quarters. The bakery at Fort Ellsworth reportedly produced 250 loaves of bread daily, which supplied some of the needs of the occupants. Travelers along the road also were able to purchase the bread, as the fort bakery made a profit from the sale of bread.

Several features within the dugouts suggest some association with food or food preparation. Feature 148, identified as the firebox within the dugout, yielded an interesting mix of unidentified grass fragments (several of which displayed characteristics similar to that of wheat), extremely charred organic residue, and a concentration of 11 fragments of plum or cherry pits. A large feature towards the center of the structure, Feature 142 was identified as a postmold. Corn kernel fragments, cucurbit shell fragments, and nutshell fragments, along with uncharred goosefoot seeds were recovered.

Dugout 13 also produced an interesting mix of archaeobotanical remains. This was somewhat unexpected, since the samples analyzed from the 1995 investigations were associated with a trash deposit immediately adjacent to the structure. Identified plant taxa from 13 flotation samples included charred junberry, poppy, goosefoot, sunflower, plum or cherry, dock, and corn. Similarities to Dugout 10 can be seen with the remains of goosefoot, plum, dock, corn, grass, and the unidentified organic residue. The charred remains were restricted to primarily two features. Feature 129, identified as a burned stone or firebox-cleaning complex, was by far the most exciting sample analyzed. Remains included corn kernel fragments, several plum or cherry pit fragments, charred seeds of goosefoot and dock, several unidentified seed fragments, sunflower seeds, and 5 seeds identified as junberry or serviceberry. Additional archaeobotanical remains were recovered from Feature 147, identified as a postmold line. Taxa identified include sunflower, purslane and poppy seeds, along with uncharred seeds of pigweed, and goosefoot.

Summary and Conclusions

In general, the flotation samples did not produce the quantities of remains that are commonly found in the matrix of prehistoric cache pits. Several possible explanations for this situation can be offered. First, we are dealing with a short period of occupation at the dugouts. In fact, there is no evidence to indicate that all of the dugouts were continuously occupied for the 3 years the fort was in operation. Second, we do not fully understand how meals were prepared and what resources were selected on a regular basis. Information provided by Alice Baldwin would lead one to believe that most meals included fried meat, stewed tomatoes and/or peaches, bread, and a beverage, suggesting that most information regarding diet would be found by analyzing faunal remains, and can or bottle fragments. She unfortunately does not describe gathering wild berries or selecting produce from a nearby garden. Third, and perhaps most important, is the record that garbage and trash was routinely swept up and dumped at a designated location some distance from the residences. The suggestion that Dugout 13 could be a non-commissioned officer's residence presents the possibility that a woman was living in the structure. Without trying to imply that men might be expected to live in dirtier abodes, I am reminded of Alice Baldwin's repeated comments on her efforts to keep her home clean. Thus, we are looking at a situation that may not likely produce significant quantities of archaeobotanical remains. Those recovered however, provide insights into the choices of foods to the occupants of a 19th century military fort. An interesting fact is that four of the taxa identified from the samples, plum (*Prunus*), poppy (*Argemone*), purslane (*Portulaca*), and sunflower (*Helianthus*) are listed in the Surgeon General's report on Barracks and Hospitals at military forts in 1870, as edible plants and fruits growing abundantly in the Smoky Hill River valley. Juneberry seeds, nutshell fragments, and weedy annuals such as goosefoot, bedstraw, and dock represent other wild resources. The remains of corn and cucurbits most likely represent garden produce, although one cannot be assured that the gardens were actually at Fort Ellsworth.

The analysis described in this paper leaves us with several questions. First, how representative are these data for understanding food choices at 19th century Plains forts?; and second, have the data added an important component to the written record? Additional investigations of other dugouts or locations at the site would certainly help identify any patterns or concentrations of specific species and may aid in the overall ability to sort evidence of wild seed rain from deliberate plant gathering practices. Excavations at the nearby Fort Harker disclosed several privies, and the analysis of flotation samples from these features will hopefully provide significant insights into what foods were selected. Investigations at Fort Leavenworth (Wagner and McNerney 1993) focused on several 19th century deposits, but flotation samples yielded limited information on plant selection. Identified taxa were limited to a few nutshell fragments, remnants of several corn cobs and seeds identified as oats. Samples collected from a late 19th century privy associated with a Manhattan residence may also identify patterns of plant use, although potentially different from those of a military fort. A preliminary examination of the Manhattan privy samples reveals a fairly significant amount of fruit seeds, including grape, raspberry, and plum.

In conclusion, flotation samples from Fort Ellsworth yielded interesting information on the use of plant foods by occupants of a 19th century military fort. In contrast to the faunal remains, which are predominately from domesticated species, the botanical remains represent a mix of both domesticated crops and wild resources. While most foods were probably supplied to the fort through the commissary and/or sutler, and leave their presence in the archaeological record as an artifact assemblage, residents had other choices. The archaeobotanical remains indicate that these choices may have included gardens and locally available and abundant wild plants. These data support the limited historic references that refer to the gathering of fresh foods, while also providing direction for any further investigations at this site or other 19th century military forts.

Chapter 7

Evaluation of Research Questions

by
Robert J. Ziegler

This chapter utilizes both documentary and archaeological evidence to address each of the research questions on site structure, subsistence, and material culture proposed in Chapter 1. The final section of the chapter further discusses a topic raised by Richard Fox in Chapter 4: the contrast between the Army's ability and willingness to supply military goods to Fort Ellsworth and its failure to develop adequate physical facilities at the post.

Site Structure

1. What types of buildings were constructed at Fort Ellsworth? Is there evidence of fences, a stockade, or sanitary facilities? What building materials were used?

Historical documents provide a picture, although incomplete, of the evolving built environment at Fort Ellsworth. For certain, it began with the construction of a blockhouse. In June 1864, Lieutenant Ellsworth completed construction of a two-story log blockhouse at the Page and Lehman ranch site. Solon True, a soldier in Company H of the 7th Iowa Cavalry who served at Fort Ellsworth from June 1864 until September 1865, recalled in his memoirs that the blockhouse was furnished with a dummy cannon designed to scare off potentially hostile Indians (Staab 1991:37). A Leavenworth journalist visiting the fort in early 1865 reported that the log blockhouse featured a subterranean passage to a never-failing source of spring water (Leavenworth Daily Conservative, 8 March 1865). This is the last reference to the blockhouse, suggesting that it was originally designed for defense but later may have also served another purpose such as a storehouse or a commissary, structures noted in subsequent historical accounts.

Construction of crude soldiers' quarters began in 1864. Solon True recalled that some of the soldiers "dug holes in the bank of the Smoky just big enough to sleep in" (Staab 1991:34). He also mentions that they cut logs to build "winter quarters" but doesn't describe these quarters (Staab 1991:36). Whether the logs were used to build dugouts or above ground log structures is not stated and there are no other existing historical accounts from 1864 to add to this sketchy picture.

Dugouts and other buildings dotted the landscape at Fort Ellsworth in 1865. Sergeant Montgomery Wisner, Co. L, 2nd Colorado Cavalry, wrote on January 23, 1865 that the men would "proceed to erect huts or burrow in the ground" (Wisner 1865). On January 31 Wisner's company "left their comfortable mud chimnies [sic] and cayote [sic] holes" and marched for Fort Larned" (Wisner in Staab 1991:76). William Darnell, a teamster who delivered supplies to Fort Ellsworth in 1865, recalled that the barracks and

officers' quarters were dugouts in the riverbank, and that the most imposing building at that time was a 25 X 40 ft. sod commissary building (Root 1928:509-510). John Morrill, a soldier in the 48th Wisconsin infantry who passed through Fort Ellsworth in September 1865, described the fort as being "a groupe [sic] of log shanties covered with dirt"; he further stated that it had a "row of caves along the river bank" and about eight or ten "log shakes" [sic] (Morrill 1865).

In 1866, Fort Ellsworth was described by a visiting journalist from Philadelphia, Charles Godfrey Leland, as a group of one-story high palisaded or stockaded huts (Leland in Staab 1991:78). Additional description of the fort's 1866 appearance is provided by Fort Ellsworth's commanding officers. In February, Brevet Major and Captain of the 2nd U.S. Cavalry, John Green, wrote in a report to headquarters at Fort Leavenworth that the enlisted men lived in "low log huts" while the three officers at the post lived in "three small huts" (J. Green to G. Smith, 7 February 1866). Dugouts are curiously absent in Green's report although the 'low log huts' occupied by the enlisted men may actually have been dugouts that other accounts record were present in 1864, 1865, and 1867. Green also noted that the stable was only a "mass of brush and dirt" hastily constructed for that purpose, and that the fort was in need of a storehouse for quartermaster and commissary stores (J. Green to G. Smith, 7 February 1866). Storehouses did exist in April 1866 because Kilburn Knox, Brevet Major and Captain of the 13th U.S. Infantry, reported to headquarters at Fort Riley that a fire broke out on 12 April and destroyed government hay but it did not spread to the storehouses or quarters NA 1865-1869:K Knox to R Torrey, 12 April 1866).

One other building, the sutler's store/post office, existed in 1866. Although the sketch of the store is entitled "Sutler Store, Fort Harker" made by George Snyder in 1866 (Figure 2.11) it most likely depicts the sutler's store at Fort Ellsworth. Mr. Snyder was one of the first sutlers at Fort Ellsworth (Montgomery 1928:250-251). Reference in the sketch to Fort Harker poses no problem, because the name of the old post was changed to Fort Harker in November, 1866. A November or December time frame is possible, for in the sketch, smoke pours forth from three chimneys. One can also determine that the one-story structure was built by two entirely different construction methods; the larger section consists of vertical logs set in the ground, stockade-style, while the smaller section is typical horizontal log construction. Both have sod roofs, pane-glass windows, and batten doors. This two-part construction suggests that an addition was built onto the original building. The original building could have been built a year earlier because Cynthia Baer (Chapter 2) has documented the presence of a sutler at the post as early as December 1865.

Judging from eyewitness accounts from the year 1867, Fort Ellsworth included several structures not previously mentioned. Elmer Otis, Special Inspector for the Department of the Missouri, reported on the conditions at Fort Harker in January and referred to some structures at the "old post" including: a 15 x 30 ft. log quartermaster storehouse, a storehouse consisting of a "small shed partially covered with canvas, a guardhouse in "one of the rude huts there," and a hospital situated in a tent (NA 1865-1869: E. Otis to J. Davidson, 10 January 1867). Other structures still used at the old post

included the bakeoven and the sutler's store (Baer, Chapter 2). The absence of a stables to shelter the horses was noted (NA 1865-1869: E. Otis to J. Davidson, 10 January 1867), so it seems that none was ever built at Fort Ellsworth. Fort Harker had a stables, but in February 1867 it was still under construction (NA 1794-1915; S. Brown to M. Meigs, 11 February 1867).

Dugouts at Fort Ellsworth were still inhabited in 1867 by enlisted men, officers, and officers wives (Baldwin 1928). According to Otis, officers and enlisted men of the 37th Infantry (Frank Baldwin's unit) were living in "miserable hovels" at the old post (NA 1865-1869: E. Otis to J. Davidson 10 January 1867). Tents also sheltered officers at Fort Harker (NA 1865-1869: A. Gibbs to L. Easton, 31 January 1867), however it is not clear if any of these were at the Fort Ellsworth site.

Only historical accounts estimate the numbers of buildings at Fort Ellsworth. In September 1865, the fort was described as having a "row of caves along the river" and about 8-10 log shacks. In October of the following year, William Hoelcken, Chief Engineer for the Department of the Missouri, stated in a report that the fort consisted of "about a dozen buildings" (NA 1866-1938: Engineer's Office, 15 October 1866). Both of these estimates are surely low since Post Returns for September and October 1866 show 167 and 340 enlisted men, respectively, assigned to the post (NA 1965). Of course, many of these men likely were assigned to the post and were not present because they were on detached duty. And although some enlisted men may have lived at Fort Ellsworth in tents, this is not documented in the historical record.

Archaeological investigations indicate that there may be as many as 14 dugouts along the riverbank and perhaps another large structure on the knoll at Locality 6. Excavation of two dugouts has verified the existence of the bakehouse and living quarters. Locating the bakehouse was one of the most significant findings of this project because it proved that Locality 6 indeed represented a portion of the site of Fort Ellsworth.

Archaeological investigations at Locality 6 failed to identify evidence of fences, a stockade, or sanitary facilities such as privies and post dumps, certainly understandable since most of our efforts focused on the investigation of the dugouts. Perhaps some of these features existed and still remain to be discovered, but at least two probably were not part of the landscape. Over the period of the fort's three-year existence, none of the eyewitness accounts mentioned the presence of a stockade, and the teamster, William Darnell, specifically mentions its absence (Root 1928:509-510). Similarly, a post dump was not noted in any historical accounts and one reliable source suggests that none was present, but one was badly needed. In early 1867, Col. Elmer Otis, Special Inspector for the Department of the Missouri, commented on the general uncleanness of Fort Harker (including the Fort Ellsworth site), and recommended regular policing and the daily removal of "kitchen slop and garbage" to "some designated site off post" (NA 1865-1869: E. Otis to J. Davidson, 10 January 1867).

Documentary sources indicate that the living quarters as well as a variety of other Fort Ellsworth structures were built from readily available logs, brush, and sod. There is simply no documentary or archaeological evidence that buildings of stone or wood frame were ever built. Logs were the primary building material for dugouts, as indicated by our archaeological investigations and surviving documents. Alice Baldwin's (1928) account as well as the sketch of the sutler's store (Figure 2.11) indicate that some milled lumber was used at the fort but only for flooring, window frames, and doors. Even the most elaborate feature thus excavated at Fort Ellsworth, the bakeoven, was constructed of materials that could have been obtained locally--clay for bricks, sand for mortar, lime derived from limestone, and large flat sandstones for the baking surface. Sandstone was used for other building purposes, as indicated by the sandstone fireplace in Dugout 13.

The Army undoubtedly supplied other materials for building construction. Numerous examples recovered from Fort Ellsworth include cut nails of all sizes, building hardware, stove plate, and window glass. With glass being the lone exception, these are the types of items that would have been transported easily and at little cost. Of course, nails and building hardware could have been hand-forged by Fort Ellsworth's blacksmiths, but Richard Fox in Chapter 4 shows that such items in the archaeological assemblage are few when compared to mass-produced materials.

2. Were the dugouts crude, hastily improvised structures as described in written accounts? Is there any evidence of a pattern of uniformity in the design and construction of the dugouts?

The structures at Fort Ellsworth have been variously described as dugouts, caves, coyote holes, log huts, log shanties covered with dirt, and hovels. Mrs. Baldwin's (1928) detailed descriptions of her dugout--the dirt, mud, rats, untrimmed logs, and unplanned floors--certainly attest to the rustic, makeshift nature of the dugouts.

It is not clear whether the quarters described in other historical accounts are dugouts or above-ground structures, but it is clear that they were not only crudely-constructed, they were also in a state of disrepair. By early 1866, Fort Ellsworth's commanding officer declared the "low log huts" (probably dugouts) occupied by the men were "utterly repairable and in Summer will be entirely uninhabitable" (NA 1865-1869:J. Green to Asst. Adjt. General, 16 April 1866). In January 1867, a correspondent for the Boston Transcript wrote that the fort had not a "single comfortable habitation" (Army and Navy Journal in King 1997:63). At about the same time, Commanding Officer, Alfred Gibbs, reported to Fort Leavenworth some of his officers lived in "hovels to [sic] poor to dignify by the appellation of shelter" (NA 1865-1869:A. Gibbs to L. Easton, 31 January 1867). Early the following year, Col. Otis described leaky, "miserable hovels" that were a "disgrace for a decent Negro to live in" (NA 1865-1869:E. Otis to J. Davidson, 10 January 1867).

Our excavations have provided new insights regarding two of Fort Ellsworth's dugouts. They were crude structures, for the most part, made from materials obtained from the local environment. Both were asymmetrical structures in which sides are only

roughly parallel and corners are not square. Logs of various sizes were used to support the roof and to finish the fronts and, in Dugout 10, the sides. Floors may have been dirt, covered with wood or rubberized cloth, or some combination. And despite their crude appearance, each dugout had a window in the front.

Our sample of dugouts is too small to really say much about uniformity in the design and construction of the dugouts at Locality 6. It is notable that the *poteaux en terre* construction method, or walls constructed by setting logs close together vertically in a trench (Morrison 1952; Kniffen and Glassie 1986), was utilized in both structures at Locality 6 even though each served an entirely different function.

One can also rely on comparative data from other contemporaneous forts in Kansas to interpret the dugouts at Fort Ellsworth. Dugouts were constructed at five other forts in Kansas: Larned, Zarah, Dodge, Wallace, and Aubrey (Ziegler 2000). Considerable numbers were built at these forts (e.g., Fort Dodge had 70 dugouts [Strate 1970:29]), however not one plan drawing or photograph of these structures has been found. Descriptions by travelers, traders, soldiers, and officer's wives suggest that most dugouts served as quarters, but some clearly served other purposes. At Fort Zarah, for example, the post headquarters was a dugout with a gunny sack for a door (Oliva 1967:168). At Fort Larned, officers' stables as well as the post bakery were in dugouts (Oliva 1982:11-12). A contemporary map of Fort Larned depicts the location of a bakery in an old meander loop of Pawnee Fork and provides the following description:

Bakery- Dug in bank. Dimensions 34 ft. x 13 ft.6

Covering. Poles, brush, hay, and straw.

Front- Pickets 7 ft. in height- one door and one six light window.

South end- One 9 light window.

Oven- 12 ft. 4 x 7 ft. 3- material adobe- chimney brick (Brown 1867).

Two contemporary sketches of military dugouts are known. The first, by Theodore Davis, appeared in Harper's Weekly magazine in 1867 and shows two dugouts in the bank of the Pawnee River at Fort Larned (Figure 2.7.) The rear walls and portions of the side walls are subterranean. The side walls and the front walls appear to be horizontal log construction, although some vertical logs are depicted in the structure in the foreground. Each structure has at least one door. Each also has a flat earth-covered roof with a stovepipe-like chimney protruding from it. It appears that some early structures, possibly dugouts, at Fort Larned were of vertical log construction; Major John McFerrand reported in 1865 that the post was built several years earlier of logs set endwise in the ground and roofed with earth (Simmons 1986:101).

In 1974, Douglas Scott investigated the remains of a dugout eroding out of the east bank of the Pawnee River at Fort Larned. The 21 ft. long clay-floored dugout contained the remains of an adobe and limestone fireplace in its rear wall; in the northeast corner, a board holding several upright nails probably served as a floorsill or joist to which wood flooring was nailed. A stove lid and an iron fireplace grating were the only

other evidence of construction materials or techniques. Artifacts recovered from the dugout clearly dated it to the military occupation of the fort (Scott 1975:66-70).

Another contemporary sketch depicts dugouts at Fort Zarah, built unto the bank of Walnut Creek (Figure 7.1). The walls consisted of vertically-set logs, with roofs of log and sod construction. A chimney protrudes from the roof of one, and both exhibit doors as well as a number of loopholes.

In the early 1970s, the Apache Chapter of the Kansas Anthropological Association excavated two semi-subterranean dugouts at Fort Zarah, each measuring 10 ft. wide and 20 ft. long. Neither structure contained evidence of a fireplace, but stove parts were found in one dugout. One of the dugouts was apparently floored with a tarpaulin, because grommets were found in place on the floor. No other structural evidence was present in the two dugouts. Artifacts from the two dugouts dated them to the military occupation of the fort (Lees 1989:35-36).

The dugouts at Forts Dodge, Wallace, and Aubrey have not been investigated archaeologically. Dugouts at Fort Dodge were described as 10 x 12 ft. dirt-walled structures, topped with sod, cottonwood branches, brush, and tents (Strate 1970:29-30). Possibly some were of vertical log construction because an officer visiting the post described "huts made of poles set endwise in the ground and covered with dirt and tents" (Simmons 1986:100). At Fort Wallace, 8 x 10 ft. holes were covered with poles, brush, and dirt (Brown 1986:197). Those at Fort Aubrey were described as 13 x 20 ft. holes topped with poles, hay, and dirt. Front walls of sod or adobe completed the structures (Barry 1973:189).

The two dugouts we excavated at Fort Ellsworth compare favorably to those at other military posts in the region. The bakery (Dugout 10) is very similar to the bakery at Fort Larned in terms of size, as well as the materials and methods used in its construction. Likewise, Dugout 13, a quarters, shares similar characteristics with other such dugouts in the region. Perhaps the best analogs for Dugout 13 are those at Fort Zarah, Fort Ellsworth's "sister" fort, established that same summer of 1864. We do not know for sure because we cannot say exactly when the dugouts were constructed or which troops actually constructed them. One thing is clear: all of the dugouts in the region appear to have been relatively small, crude structures, built for the most part from locally-available materials. However, they were not without some amenities such as windows, fireplaces, wood flooring, and stoves.

Despite serving different functions, both excavated Fort Ellsworth dugouts exhibited evidence of *poteaux en terre* construction. Building with close set vertical timbers is a remote European concept that experienced a rejuvenation in timber-rich America. It long remained popular in French America, extending from Nova Scotia to the Great Lakes region to the Mississippi Valley (Kniffen and Glassie 1986:163-165). While it is also clear that it was utilized widely at 19th century military posts in Kansas and elsewhere in the West, it rarely was used there in civilian contexts. Early settler dugouts are common, but their walls are generally earthen, rock, sod, horizontally-set

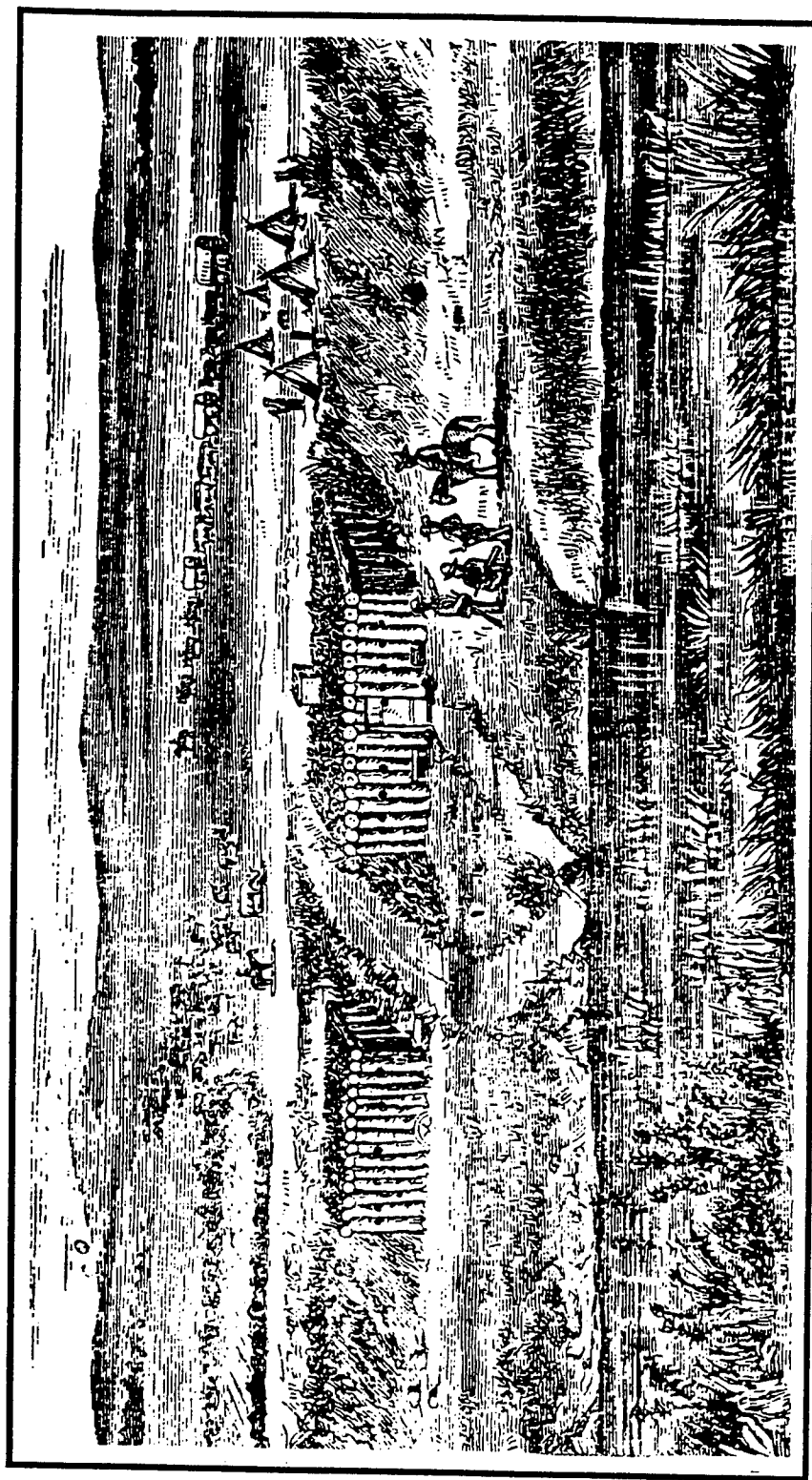


Figure 7.1. Vertical log dugouts at Fort Zarah. From *History of Kansas City Missouri*, Vol. 1 (Courtesy of Kansas City Missouri Public Library).

logs, or milled lumber. Above-ground vertical log structures are also rare in civilian contexts. Most were horizontal log cabins, although vertical log structures in civilian contexts have been documented in contemporary photographs (Ziegler 2000). The use of the vertical log construction method at Fort Ellsworth and other Western military posts is a phenomenon that deserves further study.

3. *What was the layout of the fort? To what extent did natural and cultural factors (e.g., streams, topography, roads, and defense) figure into the selection of locations for fort buildings and other structures?*

Archaeological investigations have revealed a portion of the layout of the fort. Our research shows that dugouts were constructed in close proximity to the Fort Riley/Fort Larned Road, a segment of which is still preserved today at Locality 6. These dugouts were constructed in the high (east) bank of the Smoky Hill River, with their fronts oriented toward the sun and warm winds of the southwest and west. At this location, the river as well as Spring Creek would have provided a fairly reliable source of water. Because the dugouts were located on high ground, flooding from the river would not have been a problem. The knoll above the dugouts at Locality 6 is one of the highest elevations in the immediate vicinity, thus it is reasonable to propose that a high elevation, for defensive purposes, was a consideration. One could easily speculate that the original blockhouse was built there, however, historical sources tell us that it was built on the site of old Page and Lehman ranch, now known to have been located several hundred feet to the north of the knoll at what is known today as Locality 5.

Further archaeological research is needed to reveal more information on the layout and areal extent of the fort. The fort probably extended northward along the river, perhaps some 135 m or more, encompassing the site of the abandoned Page and Lehman Ranch. To the south of Locality 6, no dugouts have been identified, but it is not unreasonable to hypothesize that the fort may have extended along the river some 200 m. to the river crossing of the southern branch of the military road there.

Subsistence

The first four questions address the diet at Fort Ellsworth. These four questions are highly interrelated and thus are addressed in one discussion.

1. *What was the composition and quality of the diet?*
2. *Was the diet representative of the standard issue military rations supplied by the Army's Commissary Department?*
3. *Were some foods and beverages likely to have been procured from the post-trader or local sources?*
4. *To what extent did hunting, fishing, or the collecting of wild plant foods supplement the diet?*

Research and analyses by Cynthia Baer, Richard Fox, John Bozell, and Mary Adair demonstrate that Fort Ellsworth residents had access to a variety of foodstuffs that went well beyond the standard Army ration of the day issued by the commissary department. We do not know exactly what the commissary issued at Fort Ellsworth because their records have not been found, but most likely, the daily rations were similar to those set forth in the Army regulations and included pork or bacon, beef, bread, beans, coffee, sugar, salt, and pepper. Records of the Post Council of Administration from 1866-1867 show that some items including bacon, salt, potatoes, flour, and hops were also purchased from the Fort Ellsworth commissary with post funds (NA 1865-1869:Council of Administration, 30 June 1866; NA 1865-1869:Council of Administration, 2 January 1867). In addition to those foods bought from the commissary, others were bought from the sutler, or were obtained from the local environment through hunting, fishing, and gathering. Post gardens, local farmers, itinerant merchants, and merchants in nearby towns such as Salina or Junction City could also have been sources of supply, however none of these can be documented archaeologically or historically.

Lieutenant Frank Baldwin and his wife, Alice, dined on fried ham, baked potatoes, stewed tomatoes, fried bacon and apples, stewed peaches, coffee, soldiers' bread, cove-oyster patties, and broiled steaks (Baldwin 1928). John Morrill reported that soldiers hunted buffalo and prairie chicken at Fort Ellsworth (Morrill 1865). Solon True mentions the hunting of buffalo, turkeys, and frogs, and the collecting of clams and dock; he also ate ear corn and baked bread with flour, salt, soda, and grease (Staab 1991:33-43). Cynthia Baer (Chapter 2) has documented that Bread, a staple of the soldiers' diet, was baked at the post bakery.

Two surviving sutler lists (Tables 2.2 and 2.3) provide a snapshot of the variety of foods that would have been available from the post-trader, or sutler. In June 1866, the sutler sold canned foods (milk, meat, oysters, fruit, and tomatoes) and yeast powder. In November 1866, he sold canned foods (fruits, oysters, meats, and milk) as well as cheese, pickles, whiskey, tea, crackers, nuts, honey, and tomatoes. Obvious differences in these lists indicate that the sutler's stock varied, thus one might assume that at other times, other foods may have been stocked.

There is no evidence that food for human consumption was purchased from local farmers or merchants. Hay was reported to have been obtained from local sources, while wood and animal feed were procured in nearby Salina (NA 1865-1869:F deCoursey to J. Jacobs, 3 December 1865; NA 1865-1869:Special Order No. 19, 15 March 1866; NA 1865-1869:Special Orders No. 3, 5 December 1865).

Containers identified by Richard Fox (Chapter 4) provide direct evidence of the consumption of a variety of food types at Fort Ellsworth. Only one type of food, sardines, could be positively identified, but many others are suggested by container size, shape, decoration, or embossing. These include canned fruits, vegetables, and meats, and bottled pickles, peppersauce, mustard, and ketchup. Alcoholic beverages are indicated by a number of wine/ale style bottles and bottles clearly marked "bitters" bottles. The sale,

consumption, and abuse of alcohol at Fort Ellsworth were well documented by Cynthia Baer in Chapter 2.

John Bozell (Chapter 5) suggests that the domestic meats played a major role in the Fort Ellsworth diet. Domestic animal bones (cattle, swine, and chicken) make up almost 75% of the Fort Ellsworth faunal sample, a figure consistent with 19th century West procurement patterns. The diet included high, medium, and low value cuts dominated by beef, with smaller amounts of pork. Although less common, poultry and eggs were also consumed.

Wild animal resources appear to have played a lesser role than domestic meats in the diet at Fort Ellsworth. Faunal remains of the following wild animals added variety to the diet: deer, pronghorn, gar, turtle, rabbit, jackrabbit, and carnivore. Although it is well documented that Fort Ellsworth soldiers hunted bison and other wild animals, exactly how much this activity added to the diet remains unknown. As Bozell points out, its role may be understated in the archaeological record because: (1) the osteological similarity between bison and cattle is subtle, thus a small amount of bison bone may be present in the Fort Ellsworth collection; (2) bone debris from hunting may have been left at field camps and kill sites; and (3) the faunal sample, having been recovered from a small portion of the site, may not be representative of the entire site. Still, given present data, it seems safe to say that domestic meats played a much larger role than wild animals did in the post diet.

Plant remains recovered from Fort Ellsworth represent a mix of domesticated crops and wild resources. Corn and curcubits represent garden produce, but not necessarily from gardens at Fort Ellsworth. Wild plant resources represented were: plum, poppy, purslane, sunflower, juneberry, nuts (possibly hickory), goosefoot, bedstraw, and dock. Mary Adair (Chapter 6) concludes that these resources provided choices in addition to those already available from either the commissary or the sutler.

Currently, we do not know the relative importance of wild foods in the diet overall, or at any one time. The accounts cited above, all from the year 1865, document the consumption of venison, buffalo, prairie chicken, turkeys, frogs, clams, and dock. Two years later, Alice Baldwin commented that the commissary in 1867 was well stocked, but "augmented frequently by game given by some wandering and venturous hunters" (Baldwin 1928:129). Beef should have been readily available by 1867, because Fort Harker had a herd of beef cattle, although the animals were thin and the beef of poor quality according to Colonel Otis (NA 1865-1869:E. Otis to J. Davidson, 10 January 1867).

Archaeological data provide no evidence to evaluate the quality of the food at Fort Ellsworth, and the documentary evidence provides only two such assessments. In 1866, the commanding officer at Fort Ellsworth reported that over $\frac{3}{4}$ of a shipment of commissary stores from Fort Zarah was unfit for consumption (NA 1865-1869:K Knox to R. Torrey, 9 April 1866). However, in 1867, the quality was reported to be "good" except for the beef cattle (NA 1865-1869:E. Otis to J. Davidson, 10 January 1867).

5. Were animals butchered or otherwise processed on-site?

Marks on the bones of cattle and swine provide evidence of primary butchering, secondary butchering, and the further reduction of meat into individual portions. These marks, of course, cannot tell us if the butchering occurred at Fort Ellsworth. Our limited excavations at Fort Ellsworth did not expose any discrete bone concentrations or features that could be interpreted as loci for on-site butchering activities. John Bozell (Chapter 5) suggests that some primary slaughtering and initial processing may have occurred on-site, but most on-site butchering activity probably involved secondary butchering and further reduction of barreled beef and pork that arrived at the post only partially butchered.

Some type of bone processing occurred within and in front of Depression 13, as evidenced by the large quantity there (more than 2500 fragments) of unidentifiable bone, as well as heavily crushed shafts of long bones from cattle and swine. A small percentage of these fragments may have resulted from post-depositional breakage, however the vast majority, together with the crushed shafts, suggest some type of processing activity, probably the extraction of marrow (Bozell, Chapter 5).

6. Where was food cooked on-site? Are there discrete discard areas for food remains?

There is no evidence that Fort Ellsworth had neither a kitchen nor a mess for the enlisted men. In early 1867, Col. Otis reported that the 37th Infantry at the Fort Ellsworth site "had neither kitchen nor mess room" and were cooking in their quarters. Food remains in association with Dugout 13 suggest that a variety of foods was cooked and consumed there. It is also likely that food was often cooked and consumed outdoors at Fort Ellsworth. Men of the 4th Cavalry at Fort Harker were reported to be cooking outdoors (NA 1865-1869:E. Otis to J. Davidson, 10 January 1867).

Officers had their meals prepared and served in their quarters or in the Officers' mess, designated for officers. Alice Baldwin (1928:124-126) describes a breakfast that was cooked by the Baldwin's striker and served to them in their dugout, but a dinner attended by the Baldwins was prepared by the commissary sergeant's wife and served to officers and their wives in the officer's mess.

Archaeological investigations at the dugouts at Fort Ellsworth indicate that food remains, food and beverage containers, and other artifacts were indiscriminately discarded by the inhabitants of the dugout. At Dugout 13, in particular, items were discarded on the dugout floor, and disposed just beyond the front door (Ziegler, Chapter 3).

Material Culture

1. Were the troops well supplied? What types of military clothing, accouterments, and equipment were supplied to the troops? What types of civilian goods were available at the fort?

Richard Fox demonstrates that troops at Fort Ellsworth were furnished with firearms, equipment, and accouterments that were part of the official Army uniform and equipage of the 1860s. In short, the men of this small temporary frontier post were similarly equipped, and their appearance differed little from troops elsewhere in the Army (Fox, Chapter 4). Although the Army appears to have supplied the troops the best they could provide, there were shortages from time to time. Infantry clothing is known to have been in short supply (NA 1865-1869:Special Orders No. 3, 5 December 1865). Supplies of arms and ammunition often ran low, and requisitions were frequently made to Fort Leavenworth for the latter (NA 1865-1869:A Gibbs to H. Noyes, 25 January 1867). Such shortages may have led to the on-site manufacture of lead bullets, as suggested by lead bars and lead sprue (Fox, Chapter 4).

As Cynthia Baer shows us in Chapter 2, many different kinds of civilian (non-military issue) goods were available from the sutler at Fort Ellsworth. He sold food items (discussed above), and everything else from garden seeds, tobacco, boots, shoes, clothing, flatware, to a variety of personal items. Soldiers (and their wives) purchased these goods with their own money, or in some cases goods were purchased with post funds. It is most interesting that subscriptions to national (Harper's Weekly, Frank Leslie's Monthly) and large city (St. Louis, New York) newspapers were purchased for the post library.

Recovered artifacts provide an invaluable source of information on the vast assortment of items (e.g., hardware, apparel, sewing, writing, grooming, and eating and cooking) actually used and later discarded, lost, or abandoned by the residents of Fort Ellsworth (Fox, Chapter 4). Some of these items (e.g., flatware, pocket knives, needles, pencils, and pens) show up on the sutler lists and could have been bought from him. Undoubtedly, soldiers and their wives brought items from home, or purchased them from itinerant merchants, or from merchants in nearby towns.

2. What types of firearms were supplied to the troops? Did innovations in firearms and ammunition reach the post rapidly?

Bullets, cartridge cases, and a firearm tool recovered from Fort Ellsworth indicate the use of a variety of firearms including the Springfield rifle musket, Colt revolver, Spencer rifle, Gallagher carbine, Colt Dragoon sidearm, Colt revolving rifle and Merrill carbine. All but the Dragoon sidearm were firearms officially in use by the Army in the 1860s (Fox, Chapter 4). Others mentioned in historical records were the Remington pistol, Starrs carbine, and Starrs revolver (NA 1864-1865:C. Clark to Commanding Officer at Fort Zarah, 13 March 1865; NA 1864-1865:Consolidated Report, 26 February 1867; NA 1865-1869:Post). These firearms, too, were officially issued to troops in the 1860s (Coates and Thomas 1990).

Archaeologically recovered Spencer cartridge cases indicate that one of the most technologically advanced weapons of the time reached the fort rather rapidly. Spencer rifles and carbines were supplied to Civil War troops beginning in 1863. Both were lever

action repeaters with a seven-round tubular magazine contained in the butt stock. This breech-loading repeater, firing an internally primed rim-fire internally primed cartridge, produced a rate of fire only limited by the user's speed in firing (Coates and Thomas 1990:35, 48).

3. What was the state of health care and sanitation? Was there a post surgeon (i.e., doctor)? What kinds of medical supplies were available? Was trash disposal regulated?

Data are scanty on health care. We know that Fort Ellsworth had no permanently assigned surgeon until George French was appointed in February 1866, and that another surgeon, George Sternberg, served at the post from May 1866 until the 1867 move to Fort Harker (NA 1965:Post Return, May 1866). In early 1867, Dr. Sternberg was reported to have lived in a "tent adjoining the hospital tents" at the "old post" (NA 1865-1869:E. Otis to J. Davidson, 10 January 1867). This is the only known reference to hospital facilities.

Diarrhea and other diseases caused much suffering, and approximately nine men died at Fort Ellsworth from disease (NA 1965:Post Returns, October 1864-January 1867). Early on, medicines to treat diseases may have been nonexistent or scarce, however the situation may have improved with time. In 1865, there were no medicines at the post, but by 1867 medicines were reported to have been of "ample and of proper character" (NA 1865-1869:F. de Courcy to J.E. Jacobs, 2 December 1865; NA 1865-1869:E. Otis to J. Davidson, 10 January 1867). Bottle or vial glass containers and container fragments recovered from Fort Ellsworth indicate usage of medicines. The few which could be identified were Mexican Mustang Liniment, Davis' Painkiller, Kelly's Old Cabin Bitters, and Swain's Bitters. Of course, post surgeons prescribed bitters, but these high alcohol content concoctions also served as an alternative way to consume alcohol (Fox, Chapter 4).

Our small sample of excavated structures suggests that the disposal of trash was little regulated at Fort Ellsworth. Trash was strewn about the floor of dugouts, and at Dugout 13, thrown out the "front door. The conditions within the dugouts mirror the lack of cleanliness reported of the barracks of the 3rd Infantry at Fort Harker in 1867: "Not cleanly. Floors dirty & wet. Slop & dirt thrown about the quarters indiscriminately, more attention should be paid to the police of these quarters "(NA 1865-1869:E. Otis to J. Davidson, 10 January 1867). Also, Colonel Otis reported on the 37th Infantry quarters at Fort Ellsworth: "Have no floors. They are in bad police being impossible to keep them in good" (NA 1865-1869:E. Otis to J. Davidson, 10 January 1867). Otis went on to recommend that barrels be required for the disposal of kitchen slop and garbage, and that these barrels were to be removed by the police to a designated spot away from the post (NA 1865-1869:E. Otis to J. Davidson, 10 January 1867).

Military Capability and Physical Facilities

Richard Fox in Chapter 4 raised this final research topic. His analysis of material culture suggests that the Army was both able and willing to supply Fort Ellsworth with up-to-date arms, military equipment, and accouterments to maintain a military capability.

On the other hand, the Army provided little support in developing physical facilities at the post. Material culture, historical documents, and our excavations of the two dugouts all point to substandard physical facilities. To understand this contrast between supplying military needs and providing adequate shelter and facilities, one must look at the U.S. Army's policies and attitudes toward Indian warfare during the third quarter of the 19th century (Ziegler 1997a).

During this time, the primary reason for stationing troops in the west was control of the Indian (Frazier 1965:ix). Army posts were most often established by a departmental commander, who decided where to place a post, then sent forth a command to build it with soldier labor, using materials readily at hand (Frazier 1965:ix; Knight 1978:112-113). This policy kept costs down and avoided lengthy delays in waiting for Congressional authorization or appropriation (Knight 1978:112-113). The expense for more substantial installations could not be justified, ran the argument, because the Indian frontier shifted frequently and was expected to soon disappear (Uteley 1984:82). Moreover, military necessity, either real or assumed, was the primary consideration for maintaining a post for any length of time (Frazier 1965:ix).

Fort Ellsworth clearly fits the pattern just described. During a general Indian outbreak in 1864, General Samuel Curtis, Commander of the Department of Kansas headquartered at Fort Leavenworth, ordered a cavalry troop to the Smoky Hill Crossing to build the fort. Economy in building the post as well as the expectation that it would only be temporary needed are implied in a July 18, 1865 report prepared by Major General Grenville Dodge, commander of the Department of the Missouri. Reporting on the posts along the Arkansas River Route (which includes Fort Ellsworth) he says:

Fort Riley and Fort Lyon are fine military posts. The intermediate posts, however, are poorly built, and are really unfit for the troops to occupy, and lack proper protection for stores. It has been expected that most of these posts would be abandoned, hence no more expense that was actually and unavoidably necessary has been incurred in fitting them up (U.S. War Department 1893, 48[1]:343).

General Dodge further implies that the Indian troubles would not last long. In a concluding paragraph of the report, he makes reference to the "final result in our Indian matters" and discusses when a campaign should begin "if it be found necessary to make a campaign next season" (U.S. War Department 1893, 48[1]:348).

As it turned out, Indians in Kansas held out much longer than expected. More forts were built along the Smoky Hill and Santa Fe Trails in Kansas, and the crude structures at Fort Ellsworth were occupied for three years, until facilities and quarters were completed at the new post, Fort Harker, only a mile away. By 1866, the need for a post in that location was perceived by Army officials to be long-term, thus the Army then was willing to incur substantial costs in construction materials, tools, labor, and transportation. Skilled civilian carpenters, masons, and other construction workers were

hired. And transportation before the railroad reached the fort in June of 1867 must have involved hundreds of wagon loads of construction materials and supplies.

In conclusion, the Army was willing to supply Fort Ellsworth with up-to-date arms and articles for military duty and daily existence. In all probability, the well-armed, well-equipped, and supplied soldier was viewed by the Army command as critical to its mission at Fort Ellsworth-- guarding the trails and protecting citizens from Indian attack. Proper shelter for the troops at Fort Ellsworth was a concern voiced by a number of officers, but little was done to improve it. Apparently, in situations where Indian hostilities were perceived to end soon, Army officials viewed adequate living quarters and physical facilities to be of little importance. Perhaps more than comfort-- the troops health and well-being-- was at stake under such primitive conditions. But that is only speculation at this point, and deserves further scrutiny.

CHAPTER 8

SUMMARY AND RECOMMENDATIONS

by
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Historical archaeologist James Deetz (1996:32) quotes an anonymous source as saying that historical archaeology is an expensive way of finding out what we already know. Perhaps this is a cynical assessment, but the point Deetz makes is that a considerable amount of historical archaeology has been done which has produced very little knowledge that is truly new, or that could not be obtained from historical documents. In this chapter I summarize what are, in my opinion, archaeology's significant contributions, to date, to our understanding of Fort Ellsworth. Much still remains unknown, so along with what we do know, I have also identified some topics that require further research.

Archaeology's Significant Contributions

Historical research identified a considerable number of documents relating to Fort Ellsworth. But these do not, by far, tell the whole story. Some of the most basic facts were not recorded, or perhaps they were recorded and simply have been lost. Discussed below are areas where archaeology has produced significant new information about Fort Ellsworth.

Location of the Fort

Surviving Documents only hinted at the fort's location. We knew it was near the military road at the Page and Lehman Ranch, but exactly where was it? Research conducted in 1995-1996 clearly identified Locality 6 as part of the fort complex. This would not have been known without the archaeological evidence. Just how far the fort extended beyond the bounds of Locality 6 still needs to be determined through further research. At this point, it is safe to hypothesize that the fort extended northward into what is known as Locality 5, the historically documented location of the Page and Lehman Ranch. Recommendations for future data recovery within this locality are presented in the next section of this chapter.

Fort Layout

Documents suggest that Fort Ellsworth was never considered to be more than a temporary post. As a temporary post, military commanders might not have felt the need to record its layout. However, our research has begun to fill in some of these details. The archaeological record clearly indicates that a series of dugouts was carved into the high terrace above the Smoky Hill River. Present data suggest that some of these served as living quarters. The post bakery was here as well, so it would not be surprising if other as yet unexcavated dugouts served other purposes besides quarters.

Construction materials and hardware suggest that at least one building was constructed on the knoll. Presumably there were officers' quarters and other structures also situated on higher ground. Presently, we do not know how many of these structures existed or where they were located.

Building Construction Methods

Our research documented the use of *poteaux en terre*, or post-in-the-ground, vertical wall construction in the dugouts at Fort Ellsworth. Written documents simply were too vague or failed to mention this. Significantly, this method of construction was used on both of the dugouts we excavated, despite the fact that each served a different function. The identification of *poteaux en terre* wall construction has corrected our notion of how dugouts at Fort Ellsworth were constructed and how they looked. The dugouts did not have the typical horizontal log construction of 19th century log cabins. Both methods were used at the fort, however, as evidenced by the sketch of the sutler's store, a two-part structure exhibiting both vertical and horizontal log walls. Further archaeological excavation is needed to determine the method(s) of wall construction in other dugouts at Fort Ellsworth.

Shelter

Alice Baldwin's account provides a wealth of information on the physical appearance and living conditions within the dugout she and her husband occupied. Archaeological remains of the quarters we excavated compare favorably to Mrs. Baldwin's description. Both had log walls, dirt or crude flooring, and a window. However, archaeological data provide details that simply did not exist in Mrs. Baldwin's or other surviving accounts. We now have material evidence of the construction methods used, and the shape, size, and available floorspace. Archaeological excavation of other dugouts may provide additional data on construction methods, size, floorspace, interior features, and possible activity areas.

Diet

Surviving fort records as well as individual personal accounts document the availability and consumption of certain fresh, canned, and bottled foodstuffs. As a result of archaeological research, we now have a fuller picture of the diet at Fort Ellsworth. Containers and container fragments provide direct evidence of the consumption of a variety of canned and bottled foodstuffs. Animal bones clearly indicate a diet dominated by beef, with lesser quantities of pork, chicken (including eggs), and wild game. Of the beef and pork, fort residents dined on a variety of cuts, not just the low value ones. Archaeobotanical remains suggest that fort residents may have had choices such as garden produce and locally available and abundant wild plant foods to supplement the foods supplied by the commissary and those available from the sutler. Lastly, the bakeoven at fort Ellsworth assured that the post at least had the technological capability to provide an adequate supply of fresh bread.

Much is still not known. In what condition were the foods when they were consumed? Also, how did enlisted men fare compared to officers? Archaeology is not likely to provide much data to address the first question. It has the potential to answer the second, if food remains associated with each group can be identified through further archaeological research.

Arms, Equipage, and Accouterments

Quartermaster records have not survived, and other documents provide little information regarding the types or quantities of arms, equipment, and accouterments supplied to the fort. While the archaeological record cannot be used to address quantities, it can, and has provided, information on types. Archaeological data from Fort Ellsworth indicate that the Army supplied the fort with some of the best firearms they could provide. These included firearms considered by Army officials to be state-of-the-art for that time- the .58 cal. Springfield rifled musket, the Spencers, the .44 cal. Colt, Gallagher carbines, and Merrill carbines. Equipage and accouterments recovered from Fort Ellsworth included many types that had been in service for some time (some since the 1840s), but all were still part of the official uniform and equipage in the 1860s. Comparisons with archaeological assemblages recovered from several other contemporaneous western forts, including Fort Leavenworth, the main supply depot for the entire west during that period, suggest that Fort Ellsworth troops were equipped and dressed in a manner similar to troops elsewhere in the Frontier Army.

It should be noted that the above conclusions are based on a relatively small number of recovered items. Small, but large enough with enough variety to draw some valid conclusions. As more of the site is investigated, we should be able to recover additional data to gain an even better understanding of this frontier fort.

Recommendations for Further Work

The following is a general outline for further archaeological data recovery as well as preservation efforts at the Fort Ellsworth site. While archaeological research has produced significant new data, it is based upon the excavation of only a minute percentage of the site. Much is still unknown, and further work is needed to better document and interpret the site. We still need to know more about how the fort grew, where quarters and other structures were located and how they were constructed, how the fort was supplied, and what everyday life was like at the fort. At the same time, efforts should be made to preserve a portion of the site for future generations.

Data Recovery at Localities 5 and 6

These two localities are of immediate concern for two reasons: (1) highly visible surface features; and (2) relatively easy access. At both localities, dugouts and other highly visible features are only ¼ mile from a gravel-covered county road. Fencing prevents direct vehicular access, but foot access is still possible. Signs bearing the

following have been posted at Locality 6, and in the future will be posted at Locality 5: "HISTORIC SITE, DIGGING OR REMOVAL OF ARTIFACTS IS PROHIBITED, VIOLATORS WILL BE PROSECUTED UNDER FEDERAL LAW."

Locality 5

This locality contains three features, two of which appear to be dugouts while the third appears to be a large circular pit. These may be the physical remains of the ranch or early fort buildings. The features at Locality 5 are also subject to another potential threat, riverbank erosion. A review of past and present aerial photographs shows that the Smoky Hill River is meandering towards these features. Not an immediate threat, riverbank erosion is a legitimate concern. I recommend data recovery excavations for all three features at Locality 5. In addition, to be certain that we have an accurate inventory of all surviving features, an intensive resurvey of the entire locality is recommended.

(Before the present report was completed, surveys, test excavations, and data recovery investigations were conducted at Locality 5 between August 1999 and September 2000. These data have yet to be analyzed. Briefly, the survey and testing work failed to identify definitive evidence of the Page and Lehman Ranch. However, data recovery investigations of the three previously recorded features confirmed the presence of two military dugouts, neither of which appears to have been built using the poteaux en terre method. The 1999 and 2000 work and analyses of collected data will be detailed in a subsequent report).

Locality 6

The two structures we excavated served entirely different purposes, thus it is important to investigate more of the 14 features that line the river terrace to understand the diversity of structures there and how the area functioned in the overall scheme of the fort. Did most of the dugouts serve as quarters, or as our small sample of two suggests, was there some mix of quarters and other structures that served other functions? Knowing how many more of these features to excavate is difficult, but I suggest the excavation of an additional two or three dugouts to obtain an adequate sample. The remaining features should then be preserved to the best extent possible.

Although evidence suggests that there was at least one structure on the knoll, no additional work is recommended there. I believe that disturbances in the 1880s and the 20th century have destroyed the integrity of much of the knoll.

Finally, resurvey is recommended along the riverbank at Locality 6, roughly from Dugout 14 southward approximately 200 m to 14EW106, the probable Smoky Hill Ford and Fort Zarah Road. Previous survey work occurred during times of thick vegetation cover. This area should be carefully resurveyed when vegetation growth is minimal.

Lower Spring Creek Drainage

The above-recommended work will vastly improve our knowledge in what I believe was the core of Fort Ellsworth, today's contiguous Localities 5 and 6. From a defensive standpoint, it makes sense that troops would be concentrated in one area rather than scattered about at a number of localities, some of which are located on the opposite (west) bank of the Spring Creek drainage. Lees and Schockley (1986) recorded the remains of dugouts at 14EW26 Localities 3 and 4 there, however, these remains are located on private property and could not be tested. Long-time resident, Mr. Lloyd Grothusen, also reports that remains of dugouts exist on private land at other localities along the west side the creek. Presently, it is not known whether these remains along Spring Creek are associated with Fort Ellsworth, Fort Harker, or later historical occupations. According to a secondary source, the Spring Creek drainage was heavily occupied during the heyday of military freighting at Fort Harker. During that time, one section of the creek bank was said to have been lined with three tiers of dugouts (Mitchell 1987:2). It is entirely possible that dugouts lined the banks of the creek from its mouth to the site of Fort Harker a mile upstream, and possibly beyond that.

More work needs to be done to understand the 19th century settlement of the lower Spring Creek drainage. This would require a minimum of an intensive survey to identify and record dugouts and other features, followed by archaeological testing of at least a sample of them. Only then will we begin to understand their role in the occupation of the area.

REFERENCES CITED

Andreas, A. T.

1883 *History of the State of Kansas*. Vol. II. A. T. Andreas, Chicago.

Andriot, John L.

1980 *Population Abstract of the United States*. Andriot Associates, McLean, Virginia.

Anonymous

1856 Report of the Commissioner of Patents for the Year 1855: Arts and Manufactures, Volume 1. *House Executive Document* No. 12, 34th Congress, 1st Session. Cornelius Wendell, Printer, Washington, DC.

Anonymous

1971 *Whitall, Tatum & Co., 1880: Illustrated Catalog and Historical Introduction*. The Pyne Press, Princeton, NJ.

Anonymous

1973 More on the St. Louis Shot Tower. *Museum of the Fur Trade Quarterly* 9(2):8-10. (by The "Engages", a pseudonym).

Anonymous

1990 Mexican Mustang Liniment. *Museum of the Fur Trade Quarterly* 25(1):9-12. (by The "Engages", a pseudonym).

Baker, T. Lindsay and Billy R. Harrison

1986 *Adobe Walls: The History and Archaeology of the 1874 Trading Post*. Texas A&M University Press, College Station.

Baldwin, Alice Blackwood (editor)

1928 *Memoirs of the Late Frank D. Baldwin, Major General, U.S.A.* Wetzel Publishing Co., Los Angeles, California.

Baldwin, Charles E., Jr.

1990 Perry Davis' Vegetable Pain Killer. *Museum of the Fur Trade Quarterly* 26(2):7-11.

Barber, John L.

1987 *The Rimfire Cartridge in the United States and Canada*. Armory Publications, Tacoma, WA.

- Bare, Janet E.
1979 *Wildflowers and Weeds of Kansas*. The Regents Press of Kansas, Lawrence.
- Barker, Wesley L. and Darold A. Dodge
1989 *Soil Survey of Ellsworth County, Kansas*. United States Department of Agriculture, Soil Conservation Service.
- Barnes, Frank C.
1993 *Cartridges of the World*. 7th edition. DBI Books, Northbrook, IL.
- Barr, Thomas P., Don D. Rowlison, and Robert G. Muir & Associates
1977 *An Archeological Inventory of the Fort Leavenworth Military Reservation*. Prepared for Department of the Army, Kansas City District, Corps of Engineers, Kansas City, Missouri.
- Barry, Louise
1973 Fort Aubrey. *Kansas Historical Quarterly* 39(2):188-199.
- Blackmar, Frank W.
1912 *Kansas: A Cyclopedia of State History*. Vol. II. Standard Publishing Company, Chicago.
- Bozell, J.R.
1991 Fauna from the Hulme Site and Comments on Central Plains Tradition Subsistence Variability. *Plains Anthropologist* 36(136):229-253.

1996 Vertebrate Remains from Historic Period Archeological Features in Lead, South Dakota. *South Dakota Archaeology* Volumes 19/20:101-115.

1997 Provisioning the Posts: Animal Bones, Diet, and Frontier Subsistence Economy. In, *The Fontenelle and Cabanne Sites: Two Missouri River Trading Posts, 1822-1838* by Richard E. Jensen. Nebraska State Historical Society (in press).
- Brinckerhoff, Sydney B.
1972 Metal Uniform Insignia of the Frontier U.S. Army. Revised edition. *Arizona Historical Society Museum Monograph* 3.

Briscoe, James

- 1992 Artifact Analyses for an Area (34Wd-74, Area A) of Historic Fort Supply, Woodward County, Oklahoma. *Oklahoma Archaeological Survey and University of Oklahoma Studies in Oklahoma's Past* No. 18.

Brown, Dee

- 1986 *The Galvanized Yankees*. Reprint of 1963 edition. University of Nebraska Press, Lincoln.

Brown, M.R.

- 1867 U.S. Military Reservation at Fort Larned. Map of file, Kansas State Historical Society, Topeka.

Brown, Pam, Chris Crabbe and Theresa Heard

- 1991 Investigation of Origin and Use of Rubber Slickers Found on the Steamboat Bertrand, DeSoto Bend National Wildlife Preserve. Unpublished ms. on file, DeSoto Bend National Wildlife Preserve, Blair, NE.

Burnside, Graham

- 1961 Cartridge Variations. In *The Gun Digest*, 15th edition, edited by John T. Amber, pp. 75-78. Gun Digest Company, Chicago.

Busch, Jane

- 1981 An Introduction to the Tin Can. *Historical Archaeology* 15(1):95-104.

Butler, William B. and J.J. Hoffman

- 1992 A Checklist of Plains Ceramic Types and Wares. *South Dakota Archaeology* 16:1-105.

Calvi, Jim

- n.d. Cultural Resource Management Handbook: An Aid for Recording Historic Sites. Unpublished ms. on file with author.

Campbell, A. M. (compiler)

- 1928a Joseph Lehman Collection. Campbell Room of Kansas Research, Salina Public Library, Salina, Kansas.
- 1928b Daniel H. Page Collection. Campbell Room of Kansas Research, Salina Public Library, Salina, Kansas.

- Campbell, Hannah
1964 *Why Did They Name It?* Fleet Publishing Company, New York.
- Caperton, Thomas J. and LoRheda Fry
1980 U.S. Army Food and its Preparation During the Indian Wars: 1865-1890. *El Palacio* 80(4):28-45.
- Carriker, Robert C. and Eleanor R. Carriker
1975 *An Army Wife on the Frontier: the Memoirs of Alice Blackwood Baldwin 1867-1877*. University of Utah Library, Salt Lake City.
- Carrington, Margaret
1983 *Absaraka: Home of the Crows*. University of Nebraska Press, Lincoln.
- Carlson, Gayle F.
1979 Archaeological Investigations at Fort Atkinson, Nebraska (25WN9), Washington County, Nebraska, 1956-1971. *Nebraska State Historical Society Publications in Anthropology* 8.
- Choitz, John F.
1967 *History of Ellsworth County*. Ellsworth County Historical Society, Ellsworth, Kansas.
- Clark, Hyla M.
1977 *The Tin Can Book: The Can as Collectible Art, Advertising Art and High Art*. New American Library, New York.
- Clifton, Robert T.
1970 *Barbs, Prongs, Points, Prickers & Stickers: A Complete and Illustrated Catalog of Barbed Wire*. University of Oklahoma Press, Norman.
- Cockrum, E.L.
1952 *Mammals of Kansas*. University of Kansas Museum of Natural History Publications 7(1). Lawrence.
- Coates, Earl J. and Dean S. Thomas
1990 *An Introduction to Civil War Small Arms*. Thomas Publications, Gettysburg, Pennsylvania.

- Cody, William F.
 1991 *The Life of Buffalo Bill*. Reprint of 1878 edition. Indian Head Books, New York.
 Cody, Colonel William F.
- Conant, R
 1975 *A Field Guide to Reptiles and Amphibians of Eastern and Central North America*.
 Houghton Mifflin Co. Boston.
- Covill, William E., Jr.
 1971 *Ink Bottles and Ink Wells*. William S. Sullwold Publishing, Taunton, MA.
- Crass, David Colin
 1990 Economic Interaction on the New Mexican Military Frontier. *Volumes in Historical Archaeology* 13. South Carolina Institute of Archaeology and Anthropology, Columbia.
- Crouch, Howard R.
 1995 *Civil War Artifacts: A Guide for the Historian*. SCS Publications, Fairfax, VA.
- DeVore, Steven L. and William J. Hunt
 1993 *Fort Union Trading Post National Historic Site (32WI17) Material Culture Reports, Part IX: Personal, Domestic and Architectural Artifacts*. Midwest Archaeological Center, Lincoln, NE.
- Deagan, Kathleen
 1991 Historical Archaeology's Contributions to Our Understanding of Early America. In *Historical Archaeology in Global Perspective*, edited by Lisa Falk, pp. 97-112.
- Deetz, James
 1988 American Historical Archaeology: Methods and Results. *Science* 239:362-367.
 1996 *In Small Things Forgotten: An Archaeology of Early American Life*. Second edition. Anchor Books, New York.
- Dunlap, Roy
 1994 22 Hornet. In *Gun Digest Treasury*, 7th Edition, edited by Harold A. Muntz, pp. 88-92. DPI Books, Northbrook, IL.
- Eakins, H.S.
 1924 *Military Meat and Dietary Hygiene*. Williams and Wilkins Co., Baltimore.

Edwards, Jay D. and Tom Wells

- 1993 Historic Louisiana Nails: Aids to the Dating of Old Buildings. *The Fred B. Kniffen Cultural Resources Laboratory Monograph Series 2*. Geoscience Publications, Louisiana State University, Baton Rouge.

Ellsworth, Allen

- 1878 Letter to T. G. Adams, 20 February 1878, from Elden, Iowa. Kansas State Historical Society, Topeka, Kansas.

Ellsworth County Historical Society [ECHS]

- 1867-1868 Journal of Post Sutler, Fort Harker, November 1867-November 1868. Ellsworth County Historical Society, Ellsworth, Kansas. Microfilm copy at Kansas State Historical Society, Topeka, Kansas.

Emerson, Alice M. and Richard A. Fox

- 1991 The Archaeology Program at the Central Barracks Site, Fort Abraham Lincoln State Park, North Dakota: Results of the 1989 Investigations (draft), volume 1. Unpublished ms. on file North Dakota State Parks and Recreation Department, Bismarck.

Emmet, Boris (editor)

- 1969 *Unabridged Facsimile, Montgomery Ward and Co. Catalog #57 (1895)*. Dover Publications, New York.

Falk, C.R., C.A. Angus, D. Morey, and D. Meyers

- 1979 *CODEX: A Simplified Numerical Coding System to Facilitate the Descriptive Analysis of Large Vertebrate Assemblages*. Department of Anthropology, Technical Report 79-15. University of Nebraska-Lincoln.

Fike, Richard E.

- 1987 *The Bottle Book: A Comprehensive Guide to Historic Embossed Medicine Bottles*. Peregrine Smith Books, Salt Lake City.

Fitch, Julian R.

- 1865 Report on Butterfield Surveying Expedition, 25 September 1865. Eugene Ware Papers, Kansas State Historical Society, Topeka, Kansas.

Fontana, Bernard L and J. Cameron Greenleaf

- 1962 Johnny Ward's Ranch: A Study in Historic Archaeology. *The Kiva* 28(1-2):1-115.

Fort Leavenworth National Cemetery

- n.d. Record Book of Interments and Reinterments, National Cemetery, Fort Leavenworth, Kansas.

Fox, Richard A.

- 1992 Results of the Archaeological Investigations at the Southwest Blockhouse Locality, Fort Phil Kearny State Historic Site (48JO70). Unpublished ms. on file Ft. Phil Kearny State Historic Site, Story, WY.
- 1994 1992 Archaeological Investigations at Fort Phil Kearny State Historic Site (48JO70): The Commanding Officer's Quarters and the Sutler's Store, Volumes 1 and 2. Unpublished ms. on file Ft. Phil Kearny State Historic Site, Story, WY.
- 1997 A Research Design for Analyzing Portions of the 1995-1996 Artifact Assemblage from the Ft. Ellsworth Site, Kansas (14EW26). Unpublished ms. on file Corps of Engineers, Kansas City District, Kansas City, MO.

Frazier, Robert W.

- 1965 *Forts of the West: Military Forts and Presidios and Posts Commonly Called Forts West of the Mississippi River to 1898*. University of Oklahoma Press, Norman.

Frederick, J. V.

- 1940 *Ben Holladay: The Stagecoach King*. Arthur H. Clark Company, Glendale, California.

Freeman, Larry

- 1964 *Grand Old American Bottles*. Century House, Watkins Glen, New York.

Fry, James B.

- 1879 *Army Sacrifices*. D. Van Nostrand, New York.

Galloway, Gene

- 1967 Archaeological Salvage at Fort Phil Kearny, 1961. *Wyoming Archaeologist* 10(1):26-42.

Gates, William C. and Dana E. Ormerod

- 1982 The East Liverpool, Ohio, Pottery District. *Historical Archaeology* 16(1-2).

Gerstell, Richard

- 1985 *The Steel Trap in North America*. Stackpole Books, Harrisburg, PA.

- Gilsvik, Bob
1980 *A Modern Trapline: Methods and Materials*. Chilton Book Co., Radnor, PA.
- Gluckman, Arcadi
1965 *Identifying Old U.S. Muskets, Rifles and Carbines*. Bonanza Books, New York.
- Goetzman, William H.
1959 *Army Exploration in the American West, 1803-1863*. Yale University Press, New Haven, Connecticut.
- Grayson, D.K.
1984 *Quantitative Zooarcheology*. Academic Press. New York.
- Grinnell, George Bird
1956 *The Fighting Cheyennes*. University of Oklahoma Press, Norman, Oklahoma.
- Guerke, Karl
1987 *Bricks and Brickmaking: A Handbook for Historical Archaeologists*. The University of Idaho Press, Moscow.
- Gust, S.M.
1983 Problems and Prospects in Nineteenth Century California Zooarcheology. In, *Forgotten Places and Things: Archeological Perspectives on American History*, edited by A.E. Ward. Contributions to Anthropological Studies 3. Center for Anthropological Studies. Albuquerque, New Mexico.
- Hanson, Charles E., Jr.
1990 Perry Davis' Vegetable Pain Killer. *Museum of the Fur Trade Quarterly* 26(2):7-11.
- Hanson, Charles E., Jr.
1967 The St. Louis Shot Tower. *Museum of the Fur Trade Quarterly* 3(3):2-5.
- Hazen, William B.
1866 Inspection Report, Fort Phil Kearny, August 29, 1866. Record Group 393, Department of the Platte, P86 (1866), National Archives, Washington, DC.
- Herskovitz, Robert M.
1978 *Fort Bowie Material Culture*. University of Arizona Press, Tucson.

Howe, Dennis E.

- 1995 The Archeological Investigations of 18th Century Temporary Shelters. In *Archeology in Fort Edward*, edited by David R. Starbuck. The Printed Word, Inc., Concord, New Hampshire.

Huelsbeck, D.R.

- 1991 Faunal Remains and Consumer Behavior: What is Being Measured? *Historical Archaeology* Volume 25(2): 62-76.

Hummel, Alice

- 1938 Advance-Guards of Civilization. *The Ellsworth Messenger*, 29 December 1938:1 and 5 January 1939:6. Ellsworth, Kansas.

Hurlburt, I.

- 1977 *Faunal Remains from Fort White Earth N.W. Co. (1810-1813)*. Provincial Museum of Alberta, Human History Occasional Paper 1. Edmonton.

Iverson, Richard J.

- 1988 *The Shotshell in the United States*. Circus Promotions, Jefferson, ME.

Jelinek, George

- 1957 *Ninety Years of Ellsworth County History*. The Messenger Press, Ellsworth, Kansas.

- 1973 *Frontier Land: Narratives of the Old West*. Published by the Ellsworth Reporter, Ellsworth, Kansas.

Jones, Olive and Katherine Sullivan

- 1989 *The Parks Canada Glass Glossary for the Description of Containers, Tableware, Flat Glass, and Closures*. Revised edition. National Historic Parks and Sites, Canadian Parks Service, Environment Canada, Ottawa.

Kansas Preservation Plan

- 1987 Study Unit on the Period of Exploration and Settlement (1820s-1880s). Kansas State Historical Society, Topeka.
- 1989 Section on Historical Archeology. Kansas State Historical Society, Topeka.

- Kapler, Todd
 1994 Fort Sisseton: Report on 1993 Archaeological Investigations at a 19th Century Frontier Military Post in Marshall County, SD. Unpublished ms. on file, Archaeology Laboratory, University of South Dakota.
- Kennedy, W.J.D.
 1997 *On the Plains with Custer and Hancock: The Journal of Isaac Coates, Army Surgeon*. Johnson Books, Boulder, Colorado.
- Kindscher, Kelly
 1987 *Edible Wild Plants of the Prairie: An Ethnobotanical Guide*. University Press of Kansas, Lawrence.
- King, Marsha K.
 1996 Summary of the Historical Development of Forts Ellsworth and Harker. Paper presented at a meeting of the Ellsworth County Historical Society, Ellsworth, Kansas.
 1997 Results of Archeological Investigations at Fort Harker (14EW310), Ellsworth County, Kansas. *Contract Archeology Publication* No.17. Kansas State Historical Society, Topeka.
 1999a Results of Phase III Archeological Investigations at Fort Dodge (14FD315), Ford County, Kansas. *Contract Archeology Publication* No.20. Kansas State Historical Society, Topeka.
 1999b Report of Phase III Archeological Investigations at Fort Wallace (14WC303), Wallace County, Kansas. *Contract Archeology Publication* No.21. Kansas State Historical Society, Topeka.
- Kniffen, Fred B. and Henry Glassie
 1986 Building in Wood in the Eastern United States: A Time-Place Perspective. In *Common Places: Reading in American Vernacular Architecture*, pp. 159-181. University of Georgia Press, Athens.
- Knight, Oliver
 1978 *Life and Manners in the Frontier Army*. University of Oklahoma Press, Norman.
- Koch, A.
 1995 The McIntosh Fauna: Late Prehistoric Exploitation of Lake and Prairie Habitats in the Nebraska Sand Hills. *Plains Anthropologist* 40(151): 39-60.

- Kopec, John A. and H. Sterling Fenn
1994 *Colt Cavalry and Artillery Revolvers: A Continuing Study*. John A. Kopec Publications, Whitmore, CA.
- Kuchler, A.W.
1974 A New Vegetation Map of Kansas. *Ecology* 55:586-604.
- Labisky, Wallace
1973 The Ever-Changing Shotgun Story. *Gun Digest*. 27th Edition.
- Leaf, Gary R.
1976 Background Data for a Preliminary Shoreline Reconnaissance and a Management Program for the Cultural Resources of the Kanopolis Reservoir, Ellsworth County, Kansas. Report submitted to the U.S. Army Corps of Engineers, Kansas City District.
1977 A Preliminary Shoreline Reconnaissance and a Management Program for the Cultural Resources of Kanopolis Lake, Ellsworth County, Kansas. Report submitted to the U.S. Army Corps of Engineers, Kansas City District.
- Lee, Wayne C. and Howard C. Raynesford
1980 *Trails of the Smoky Hill*. Caxton Printers, Caldwell, Idaho.
- Lees, William B.
1989 *Kansas Preservation Section on Historical Archeology*. Archeology Department, Kansas State Historical Society, Topeka.
- Lees, William B. and Dennis Schockley
1986 History and Historic Archeology of the Kanopolis Lake Area. Report submitted to the U.S. Army Corps of Engineers, Kansas City District.
- Legg, James B. and Steven D. Smith
1989 The Best Ever Occupied: Archaeological Investigations of a Civil War Encampment on Folly Island, South Carolina. *Research Manuscript Series No. 209*, South Carolina Institute of Archaeology and Anthropology, Columbia.
- Levie, A.
1979 *The Meat Handbook*. Fourth edition. The Avi Publishing Company, Inc. Westport, Connecticut.

Levine, Bernard

1993 *Levine's Guide to Knives and Their Values*. Expanded 3rd edition. DBI Books, Northbrook, IL.

1997 *Levine's Guide to Knives and Their Values*. Revised 4th edition. DBI Books, Iola, WI.

Logan, Herschel C.

1959 *Cartridges: A Pictorial Digest of Small Arms Ammunition*. Bonanza Books, New York.

Lord, Francis A.

1963 *Civil War Collector's Encyclopedia: Arms, Uniforms and Equipment of the Union and the Confederacy*. Castle Books, Secaucus, New Jersey.

1995 *Civil War Collector's Encyclopedia: Volumes I and II*. Blue and Gray Press, Edison, New Jersey.

1995 *Civil War Collector's Encyclopedia: Volumes III, IV, and V*. Blue and Gray Press, Edison, New Jersey.

Lundquist, Myrtle

1970 *The Book of a Thousand Thimbles*. Wallace-Homestead Book Co., Des Moines, IA.

Luscomb, Sally

1967 *The Collector's Encyclopedia of Buttons*. Bonanza Books, New York.

Lyon, Charles J.

1879 *Compendious History of Ellsworth County, Kansas*. The Reporter Press, Ellsworth, Kansas.

Malone, Dumas (editor)

1934 *Dictionary of American Biography*. Volume VII, Mills - Platner. Charles Scribner's Sons, New York.

Marquis' Who's Who, Inc.

1968 *Who Was Who in America*. Volume 1, 1897-1942. Marquis' Who's Who, Inc., Chicago.

- Mattes, Merrill J.
1947 Project Report on Historical Aspects of Kanopolis Reservoir on Smoky Hill River, Kansas. Report submitted to the National Park Service, Denver.
- Maxwell, D.B.S.
1993 Beer Cans: A Guide for the Archaeologist. *Historical Archaeology* 27(1):95-113.
- McAulay, John D.
1981 *Carbines of the Civil War, 1861-1865*. Pioneer Press, Union City, TN.
1987 *Civil War Breechloading Rifles: A Survey of the Innovative Infantry Arms of the American Civil War*. Andrew Mobray, Inc., Lincoln, RI.
- McBride, W. Stephen and William E. Sharp
1991 Archaeological Investigations at Camp Nelson: A Union Quartermaster Depot and Hospital in Jessamine County, Kentucky. *Archaeological Report* No. 241, Program for Cultural Resources Assessment, University of Kentucky, Lexington.
- McCallum, Henry D. and Frances T. McCallum
1965 *The Wire That Fenced the West*. University of Oklahoma Press, Norman.
- McChristian, Douglas C.
1995 *The U.S. Army in the West, 1870-1880: Uniforms, Weapons, and Equipment*. University of Oklahoma Press, Norman.
1997a Letter, McChristian to Richard A. Fox, July 6.
1997b Personal communication, June 12.
- McKearin, Helen and Kenneth M. Wilson
1978 *American Bottles and Flasks and Their Ancestry*. Crown Publishers, Inc., New York.
- McKee, W. Reid and M.E. Mason
1980 *Civil War Projectiles II: Small Arms and Field Artillery (with supplement)*. Rapidan Press, Mechanicsville, VA.
- Mead, James R.
1986 *Hunting and Trading on the Great Plains, 1859-1875*. University of Oklahoma Press, Norman, Oklahoma.

- Meline, James F.
 1966 *Two Thousand Miles on Horseback*. Horn & Wallace Publishers, Albuquerque, New Mexico.
- Miller, Mark E., Jeffrey Hauff and Danny N. Walker (editors)
 1997 Historic Archaeology at the Wagon Box Battlefield (48SH129), Sheridan and Johnson Counties, Wyoming. Unpublished ms., Office of the Wyoming State Archaeologist, Division of Cultural Resources, Division of State Parks and Historic Sites, Wyoming Department of Commerce, Laramie.
- Miner, Craig
 1986 *West of Wichita: Settling the High Plains of Kansas, 1865-1890*. University Press of Kansas, Lawrence, Kansas.
- Minnis, Paul E.
 1987 Identification of Wood from Archaeological Sites in the American Southwest, I. Keys for Gymnosperms. *Journal of Archaeological Science* 14:121-131.
- Mitchell, Pat
 1987 The Faris Caves. *Kanhistique*, September, p.2.
- Monaghan, Jay
 1955 *Civil War on the Western Border, 1854-1865*. University of Nebraska Press, Lincoln, Nebraska.
- Montgomery, Mrs. Frank C.
 1928 Fort Wallace and Its Relation to the Frontier. *Kansas Historical Collections* 17:189-283.
- Moos, Harry
 1968 Cartridge Collecting: UMC Shotshells. *Shooting Times* 9(7):38-41.
- Morrill, John
 1865 John Morrill Letters, September - December 1865. Kansas State Historical Society, Topeka, Kansas.
- Morrison, Hugh
 1952 *Early American Architecture*. Dover Publications, New York.

Muir, Robert

- 1865 Letter to brother, 10 September 1865. Muir Papers, Campbell Room of Kansas Research, Salina Public Library, Salina, Kansas.

Mundell, R.L.

- 1979 Descriptive Analysis of Vertebrate Remains from Fort Atkinson: The Military Period. In, *Archeological Investigations at Fort Atkinson (25WN9): Washington County, Nebraska, 1956-1971* by Gayle F. Carlson. Nebraska State Historical Society Publications in Anthropology 8. Lincoln.
- 1981 Faunal Remains. In, *Fort Manuel: The Archeology of an Upper Missouri Trading Post of 1812-1813* by G.H. Smith and J. Ludwickson. Special Publication of the South Dakota Archeological Society 7.

Murray, H.D. and A.B. Leonard

- 1962 *Handbook of Unionid Mussels in Kansas*. University of Kansas Museum of Natural History Miscellaneous Publications 28. Lawrence.

National Archives [NA]

- 1794-1915 Records of Office of Quartermaster General. Consolidated Correspondence File. Forts Ellsworth and Harker. *Record Group 92*. National Archives, Washington, D.C.
- 1864-1865 U.S. Army Continental Commands. Fort Zarah, Kansas. *Record Group 393, Part 5*. National Archives, Washington, D.C.
- 1866-1938 Records of the Bureau of Land Management. General Land Office. Abandoned Military Reservations. Forts Ellsworth and Harker, Kansas. *Record Group 49*. National Archives, Washington, D.C.
- 1865-1869 U.S. Army Continental Commands. Fort Harker, Kansas. *Record Group 393, Part 5*. National Archives, Washington, D.C.
- 1867-1874 U.S. Army Continental Commands. Fort Hays, Kansas. *Record Group 393, Part 5*. National Archives, Washington, D.C.
- 1965 *Returns from U.S. Military Posts, 1800-1916. Fort Harker, Kansas, 1864-1873*. National Archives, Washington, D.C. Microfilm.

Noel Hume, Ivor

- 1972 *A Guide to the Artifacts of Colonial America*. Alfred A. Knopf, New York.

O'Brien, Patricia

- 1994 The Central Lowland Plains: an overview, A.D. 500-1500. In *Plains Indians, A.D. 500-1500; the Archaeological Past of Historic Groups*, edited by Karl H. Schlesier, pp. 199-223. University of Oklahoma Press, Norman.

Oliva, Leo

- 1967 *Soldiers on the Santa Fe Trail*. University of Oklahoma Press, Norman.
- 1980 *Fort Hays, Frontier Army Post, 1865-1889*. Kansas State Historical Society, Topeka, Kansas.
- 1982 *Fort Larned on the Santa Fe Trail*. Kansas State Historical Society, Topeka, Kansas.

Owsley, Douglas W., James K. Krakker, Milton Jacobs, Robert W. Mann, and Clark B. Hall

- n.d. The History and Archaeology of St. James Episcopal Church, Brandy Station, Virginia. Privately published, St. Christ Episcopal Church, Brandy Station.

Pearsall, Deborah

- 1989 *Paleoethnobotany: A Handbook of Procedures*. Academic Press, San Diego.

Perino, Gregory

- 1968 Guide to the Identification of Certain American Indian Projectile Points. *Oklahoma Anthropological Society Special Bulletin* No. 3.

Perry, Leslie and William J. Hunt

- 1986 Class IV: Apparel and Adornment. In unpublished ms., Fort Union Trading Post National Historic Site (32WI17) Material Culture Reports, Part III: Personal and Recreational Materials, edited by William J. Hunt, pp. 18-25. Midwest Archaeological Center, National Park Service, Lincoln, NE.

Polak, Michael

- 1994 *Bottles: Identification and Price Guide*. Avon Books, New York.

Price, C. Houston

- 1996 *Official Price Guide to Collector Knives*. House of Collectibles, New York.

Putnam, P.A.

- 1968 *Bottled Before 1865*. Rapid Blue Print Co., Los Angeles.

Rath, Jo Anne

1979 *Antique and Unusual Thimbles*. A.S. Barnes and Company, New York.

Reilly, Robert M.

1970 *United States Military Small Arms, 1816-1865: The Federal Firearms of the Civil War*. Eagle Press, Inc., Baton Rouge, LA.

Revi, Albert C.

1964 *American Pressed Glass and Figure Bottles*. Thomas Nelson and Sons, New York.

Reynolds, J.D.

1983 *Archeological Investigations at Old Fort Scott, 14BO302, Fort Scott Kansas, 1968 to 1972*. Prepared for the U.S. National Park Service. Kansas State Historical Society. Topeka.

Rickey, Don, Jr.

1963 *Forty Miles a Day on Beans and Hay: The Enlisted Soldier Fighting the Indian Wars*. University of Oklahoma Press, Norman.

Ring, Carlyn

1980 *For Bitters Only*. The Pi Press, Wellesley, MA.

Rock, James T.

1984 Cans in the Countryside. *Historical Archaeology* 18(2):97-111.

Root, George A.

1928 Reminiscences of William Darnell. *Kansas Historical Collections* 17.

Rosa, Joseph G.

1982 *The West of Wild Bill Hickok*. University of Oklahoma Press, Norman.

Russell, Don

1960 *The Lives and Legends of Buffalo Bill*. University of Oklahoma Press, Norman, Oklahoma.

Russell and Erwin

1980 *Illustrated Catalog of American Hardware of the Russell and Erwin Manufacturing Company, 1865*. Reprint, Association for Preservation Technology and Pub Press, Inc., Baltimore.

- Salina Public Library [SPL]
1863-1917 Morrison Family Collection. Campbell Room of Kansas Research, Salina Public Library, Salina, Kansas.
- Schild, Gary
1972 *Tobacco Tin Tags*. John L. Prentice and Company, Meriden, CT.
- Schroy, Ellen T.
1995 *Warman's Glass*. 2nd edition. Wallace-Homestead Book Company, Radnor, PA.
- Schuyler, Hartley and Graham
1985 *Illustrated Catalog of Civil War Military Goods; Union Weapons, Insignia, Uniform Accessories and Other Equipment*, by Schuyler, Hartley & Graham. Dover Publications, New York.
- Scott, Douglas D.
1975 1974 Excavations at Fort Larned National Historic Site. Report submitted to the National Park Service, Denver.
- Scott, Douglas D. and Richard A. Fox, Jr.
1987 *Archaeological Insights into the Custer Battle: An Assessment of the 1984 Field Season*. University of Oklahoma Press, Norman.
- Shoaf, Mrs. Raymond
1938 History of Fort Harker. *Ellsworth Reporter*, 27 January:6. Ellsworth, Kansas.
- Sigstad, John S.
1969 Mowry Bluff Artifacts: Pottery. *Plains Anthropologist Memoir* 6:17-22.
- Simmons, Marc (Editor)
1986 *On the Santa Fe Trail*. University Press of Kansas, Lawrence.
- Smith, Carlyle S.
1949 Archeological Investigations in Ellsworth and Rice Counties, Kansas. *American Antiquity* 14(4) 292-300.

1960 Cartridges and Bullets from Fort Stevenson, North Dakota. In *Archaeological Investigations at the Site of Fort Stevenson, (32ML1), Garrison Reservoir, North Dakota* by G. Hubert Smith, Frank H. Roberts, editor, pp. 232-238. Smithsonian Institution Bureau of American Ethnology Bulletin 176, River Basin Survey Papers 19.

Spillman, Jane S.

- 1983 *The Knopf Collectors' Guides to American Antiques, Glass: Volume 2, Bottles, Lamps and Other Objects*. Alfred A. Knopf, New York.

Staab, Rodney (editor)

- 1991 *A Soldier on the Santa Fe Trail: The Memoir of Private Solon True*. Manuscript provided by the author. Kansas City, Kansas.

Starbuck, David R.

- 1994 *The Identification of Gender at Northern Military Sites of the Late Eighteenth Century*. In *Those of Little Note: Gender, Race, and Class in Historical Archaeology*, edited by Elizabeth M. Scott. University of Arizona Press, Tucson.

Steffen, Randy

- 1978 *The Horse Soldier, 1776-1943: Volume 2, The Frontier, the Mexican War, the Civil War, the Indian Wars, 1851-1880*. University of Oklahoma Press, Norman.

Steinbach, Robert H.

- 1989 *A Long March: The Lives of Frank and Alice Baldwin*. University of Texas Press, Austin.

Stewart, Ron and Roy Ritchie

- 1986 *The Standard Knife Collector's Guide*. Collector Books, Paducah, KY.

Steyermark, Julian A.

- 1963 *Flora of Missouri*. Iowa State University Press, Ames.

Strong, William D.

- 1935 *An Introduction to Nebraska Archaeology*. *Smithsonian Miscellaneous Collections* 93 (10), Washington, DC.

Sudderth, W.E.

- 1992 *The 1983 Archaeological Investigations at the Ray house, Wilson's Creek National Battlefield, Missouri*. *Midwest Archaeological Center Technical Report* 15. Midwest Archaeological Center, National Park Service, Lincoln, NE.

Switzer, Ronald R.

- 1970 *Lead Bars from the St. Louis Shot Tower*. *Museum of the Fur Trade Quarterly* 6(4):5-6.

1974 *The Bertrand Bottles*. National Park Service, U.S. Department of the Interior, Washington, DC.

The Great Plains Flora Association

1986 *Flora of the Great Plains*. The University Press of Kansas. Lawrence.

Todd, Frederick P.

1974 *American Military Equipage, 1851-1872*. The Company of Military Historians, Providence, RI.

Toulouse, Julian H.

1969 *Fruit Jars*. Thomas Nelson and Sons, Camden, NJ.

U.S. Department of Agriculture

1977 *Beef Slaughtering, Cutting, Preserving, and Cooking on the Farm*. Farmer's Bulletin No. 2263.

1983 *Pork Slaughtering, Cutting, Preserving, and Cooking on the Farm*. Farmer's Bulletin No. 2265.

U.S. War Department

1893 *War of the Rebellion: A Compilation of the Official Records of the Union and Confederate Armies*. Series I. U.S. Government Printing Office, Washington, D.C.

Utley, Robert M.

1981 *Frontiersman in Blue: The United States Army and the Indian, 1848-1865*. Reprint of 1967 edition. University of Nebraska Press, Lincoln.

1984 *Frontier Regulars: The United States Army and the Indian, 1866-1891*. Reprint of 1973 edition. University of Nebraska Press, Lincoln.

van Rensselaer, Stephen

1969 *Early American Bottles and Flasks*. Revised edition. J. Edmund Edwards, Stratford, CN.

Vassar, Lyndal G.

1988 *The Descendants of John Vasser of Virginia (1635-1984): A Family History*. First Word Desktop Publishing Company, Stillwater, Oklahoma.

Vinson, Carlos

1968 Collecting Shotshells. *Gun Digest*. 22nd edition.

Wagner, Mark J., Mary R. McCorvie, Brad Koldehoff, Terrance J. Martin, and Kathryn E. Parker
1989 *Phase I, II, and III Archaeological Investigations at Fort Leavenworth, Kansas*. Cultural Resources Management Report No. 132. American Resources Group, Ltd., Carbondale, Illinois. Prepared for Kansas City District, Corps of Engineers, Contract No. DACA41-86-D-0064.

Wagner, Mark J., Frances R. Knight, Tracey Sandefur, Kathryn E. Parker, Terrance J. Martin, and J. C. Richmond

1993 *Phase II Archaeological Investigations at Fort Leavenworth, Kansas*. Cultural Resources Management Report No. 199. American Resources Group, Ltd., Carbondale, Illinois. Prepared for Higganbotham, Briggs, and Associates.

Wetherbee, Jean

1996 *White ironstone: A Collector's Guide*. Antique Trader Books, Dubuque, IA.

Wedel, W.R.

1986 *Central Plains Prehistory: Holocene Environments and Culture Change in the Republican River Basin*. University of Nebraska Press. Lincoln.

Welty, Raymond L.

1938 Supplying the Frontier Military Posts. *Kansas Historical Quarterly* 7:154-169.

White, Henry P. and Burton D. Munhall

1977 *Cartridge Headstamp Guide*. First revision. H.P. White Laboratory, Inc., Bel Air, MD.

Wilson, Bill and Betty Wilson

1971 *19th Century Medicine in Glass*. 19th Century Hobby and Publishing Co., Amador, CA.

Wilson, Francis L.

1979 *A History of Ellsworth County, Kansas*. Ellsworth Printing Company, Ellsworth, Kansas.

Wilson, Frank

1984 Landscapes: A Geologic Diary. In *Kansas Geology*, edited by Rex Buchanan, pp. 9-39. University Press of Kansas, Lawrence.

- Wilson, Rex L.
1981 *Bottles on the Western Frontier*. University of Arizona Press, Tucson.
- Wisner, M
1865 Letter dated 23 January. In *A History of the 2nd Colorado Cavalry as Presented in Soldier's Letter: A Regimental Paper to Accompany the Regiment*, edited by Oliver V. Wallace. On file, U.S. Army Military History Institute, Carlisle Barracks, Pennsylvania.
- Witty, Tom
1978 Along the Southern Edge: the Central Plains Tradition in Kansas. In *The Central Plains Tradition: Internal Development and External Relationships*, edited by Donald J. Blakeslee, pp. 56-66. Report 11, Office of the State Archaeologist, University of Iowa, Iowa City.
- Wright, David
1997 Personal communication, August 7.
- Yentsch, Anne Elizabeth
1994 *A Chesapeake Family and Their Slaves: A Study in Historical Archaeology*. Cambridge University Press, New York.
- Yeoman, R.S.
1992 *A Guide Book of United States Coins*. Western Publishing Company, Racine, Wisconsin.
- Ziegler, Robert. J.
1996 Data Recovery Plan: Fort Ellsworth Archaeological Site (14EW26), Kanopolis Lake, Kansas. U.S. Army Corps of Engineers, Kansas City District.

1997a The Frontier Army's Commitment to Fort Ellsworth. Paper Presented at the 55th Annual Plains Anthropological Conference, Boulder, Colorado.

1997b Scope of Work: Analysis and Description of the Artifact Collection Recovered from Ft. Ellsworth, Kanopolis Lake, Kansas, 1995-1996. Unpublished ms. on file, Corps of Engineers, Kansas City District, Kansas City, MO.

1999 The Material Factors of Everyday Life at Fort Ellsworth, Kansas (1864-1867). Paper Presented at the 32nd Annual Meeting of the Society for Historical Archaeology, Salt Lake City, Utah.

2000 Impermanent Architecture at 19th Century U.S. Army Forts on the Central Plains.
Paper Presented at the 33rd Annual Meeting of the Society for Historical
Archaeology, Quebec City, Canada.

Zumwalt, Betty

1980 *Ketchup, Pickles, Sauces: 19th Century Food in Glass*. Mark West Publishers,
Fulton, CA.

APPENDIX A

GEOPHYSICAL INVESTIGATION

by
Steven L. De Vore

Introduction

Between March 25 and 29 and May 14 and 16, 1996, the National Park Service conducted geophysical investigations at Fort Ellsworth, a nineteenth century military post located adjacent to the Smoky Hill River within the boundary of the U.S. Army Corps of Engineers'(COE) Kanopolis Lake, Ellsworth County, Kansas (Figure A1). The investigations were conducted in order to provide subsurface information concerning the site for proposed summer excavations.

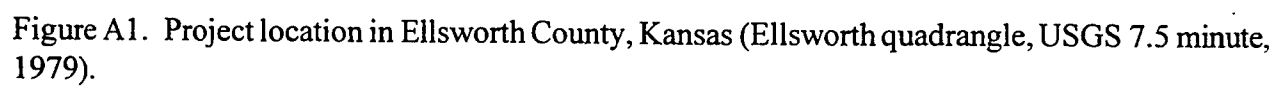
Geophysical Survey Methods

Magnetic and resistance surveys were conducted during the week of March 25 through 29. Utilizing the COE datum at N500 E500 (the datum was established in feet and the base line oriented true north - an earlier baseline was established 20 degrees west of true north and had rebar set at 50 ft intervals), a series of 20 x 20 m grids were established. The geophysical grid was oriented towards magnetic north with is approximately 8 degrees east of true north (Figure A2). The geophysical grid extends 40 meters on both sides of the north-south grid base line and 60 m on both sides of the east-west grid base line. The grid measures 120 m north-south by 80 m east-west (for data processing purposes, the grid was extended another 40 m to the west). The magnetic survey covered sixteen complete grids and three partial grids. The initial resistance survey covered fourteen complete and three partial grids. Due to the inclement weather and its effect on the resistance meter, eight of the fourteen grids covered during the initial resistance survey were re-surveyed between May 14 and 16 along with two grids that had not been previously surveyed with the resistance meter.

Magnetic Survey

A magnetic survey is a passive geophysical technique used to measure the earth's total magnetic field at a point location. Its application to archeology results from the effects of magnetic materials on the earth's magnetic. These anomalous conditions result from magnetic materials and minerals buried in the soil. Iron artifacts have a very strong effect on the local earth's magnetic field. Other cultural features which affect the local earth's magnetic field include fire hearths, soil disturbances, such as pits, mounds, wells, pithouses, dugouts, etc., and geological features.

The magnetic survey was conducted with a Geoscan Research FM36 Fluxgate Gradiometer. The gradiometer consists of a control unit which contains the electronics and memory. The control unit is attached to the vertical sensor tube which contains two fluxgate magnetometer sensors. With



FORT ELLSWORTH ARCHEOLOGICAL SITE (14EW26-VI)
KANOPOLIS LAKE, ELLSWORTH COUNTY, KANSAS

Geophysical Survey, 25-29 March and 14-16 May 1996



Magnetic North

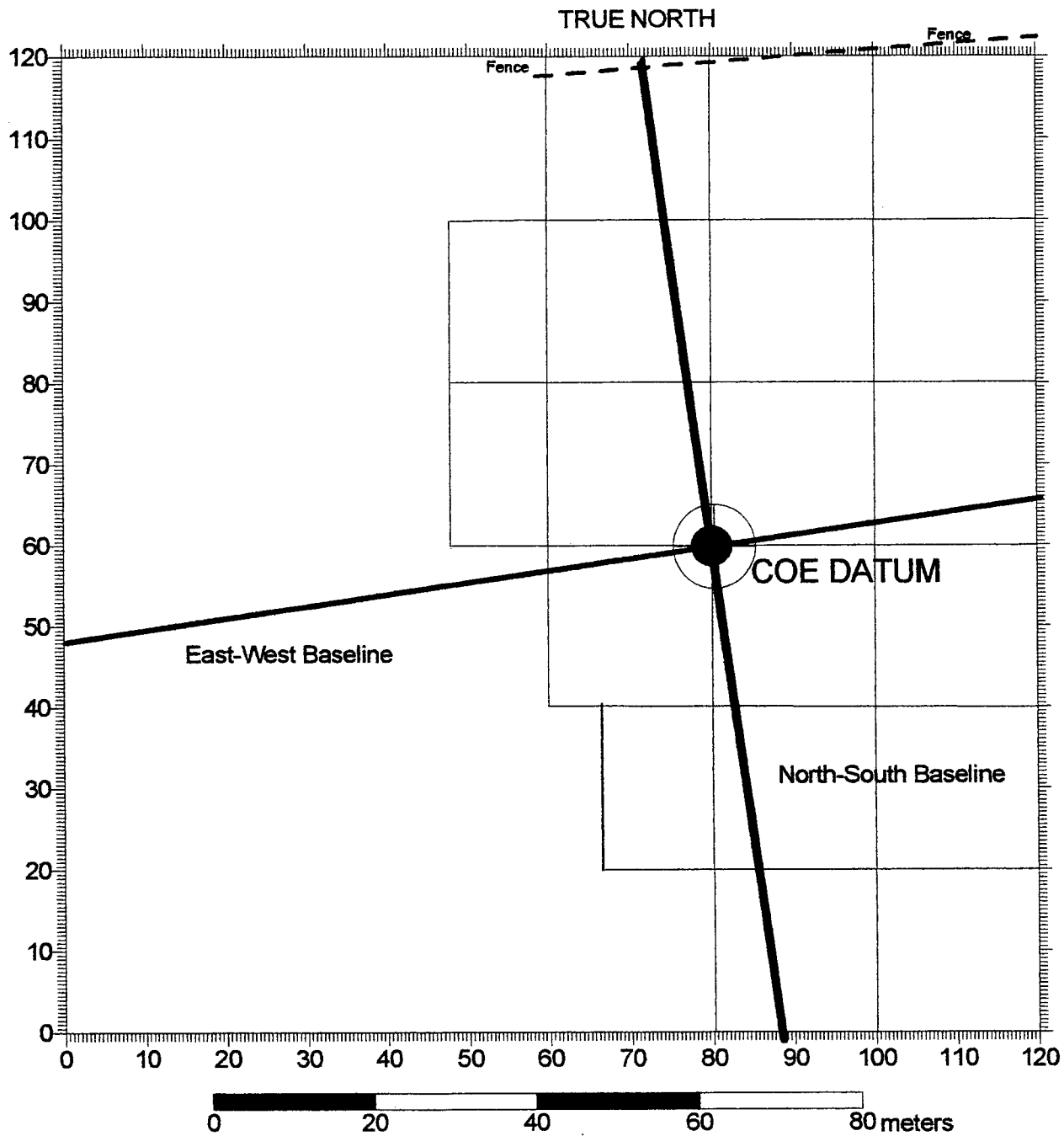


Figure A2. Geophysical project location and grids at 14EW26, Locality 6.

a built-in data logger, the gradiometer provides fast and efficient surveying. Two readings are taken at each point along a survey traverse, one at the upper sensor and one at the lower sensor. The difference or gradient between the two is calculated and recorded in the instrument's memory. For the magnetic survey, the gradiometer was configured to record data at a sampling interval of 0.125 m or 8 samples per meter. The survey was conducted along one meter transverses in a zig-zag fashion across the grid beginning in the southwest corner. The data was downloaded to a laptop computer in the field and processed using the Geoscan Research Geoplot ver. 2.01 software. Shade, dot density, and trace plots were generated each evening as the field work progressed. Contour plots were generated in Surfer for Windows.

Analysis of the gradiometer data from the site indicated the presence of 15 anomalies (Figures A3 and A4). At the southern end of the grid adjacent to Depression 13, Anomaly 1, a number of non-normal dipoles, appears to represent an area of metal artifacts discarded along the outside wall of the dugout. A normal dipole anomaly is one which is oriented with its high value on the south side and its negative value on the north side similar to the way the magnetic field of the earth behaves or a permanent magnet. Non-normal dipoles (different positive-negative value orientations) generally represent iron artifacts or disturbed soil or excavated fill. Anomaly 2, located along the southeast corner of the grid, also appears to represent a collection of discarded metal. Anomaly 3 is a normal dipole and is located in the vicinity of Depression 12. The anomaly may represent a fire hearth. This is an area containing a concentration of rocks. Anomaly 4 consists of several non-normal dipoles and apparently represents iron artifacts in and around Depression 10. To the south of the anomaly lies Depression 11 and to the north lies Depression 8. Anomaly 5 may also represent iron artifacts associated with Depression 7 or the location of the subsurface excavation cut to form the dugout wall. Anomaly 6 is located along the ridge top immediately east of Depression 7. It apparently represents a small piece or concentration of iron artifacts. Anomaly 7 is a series of non-normal dipoles associated with Depression 6. It would appear that this anomaly represents a discard area adjacent to the dugout. Anomaly 8 represents the rebar used as the COE datum on the site at N500/E500. To the east of Anomaly 8 is an anomalous area that may be one of the previous excavation units on the site. Anomaly 9 is a relatively strong normal dipole located within Depression 3. The anomaly may represent a fire hearth or an iron artifact. Anomaly 10 is a series of non-normal dipoles on the north side of the farm lane through the site. It probably represents a collection of iron artifacts dumped in this area. Anomalies 11 and 13 are adjacent to Depression 2 and the farm lane. They may be iron artifacts associated with Depression 2 or they may represent the excavated portion of the farm lane as it cuts through the side slope. Anomaly 12 is caused by the barbed wire fence at the north end of the geophysical grid. The barbed wire and steel fence posts have a major effect on the magnetic field in this location. Anomaly 14 is a normal dipole which is probably an iron artifact (i.e., an excavation corner stake - rebar) or concentration of iron in a single location. Anomaly 15 is strong normal dipole within Depression 10. It may represent a iron artifact or a fire hearth.

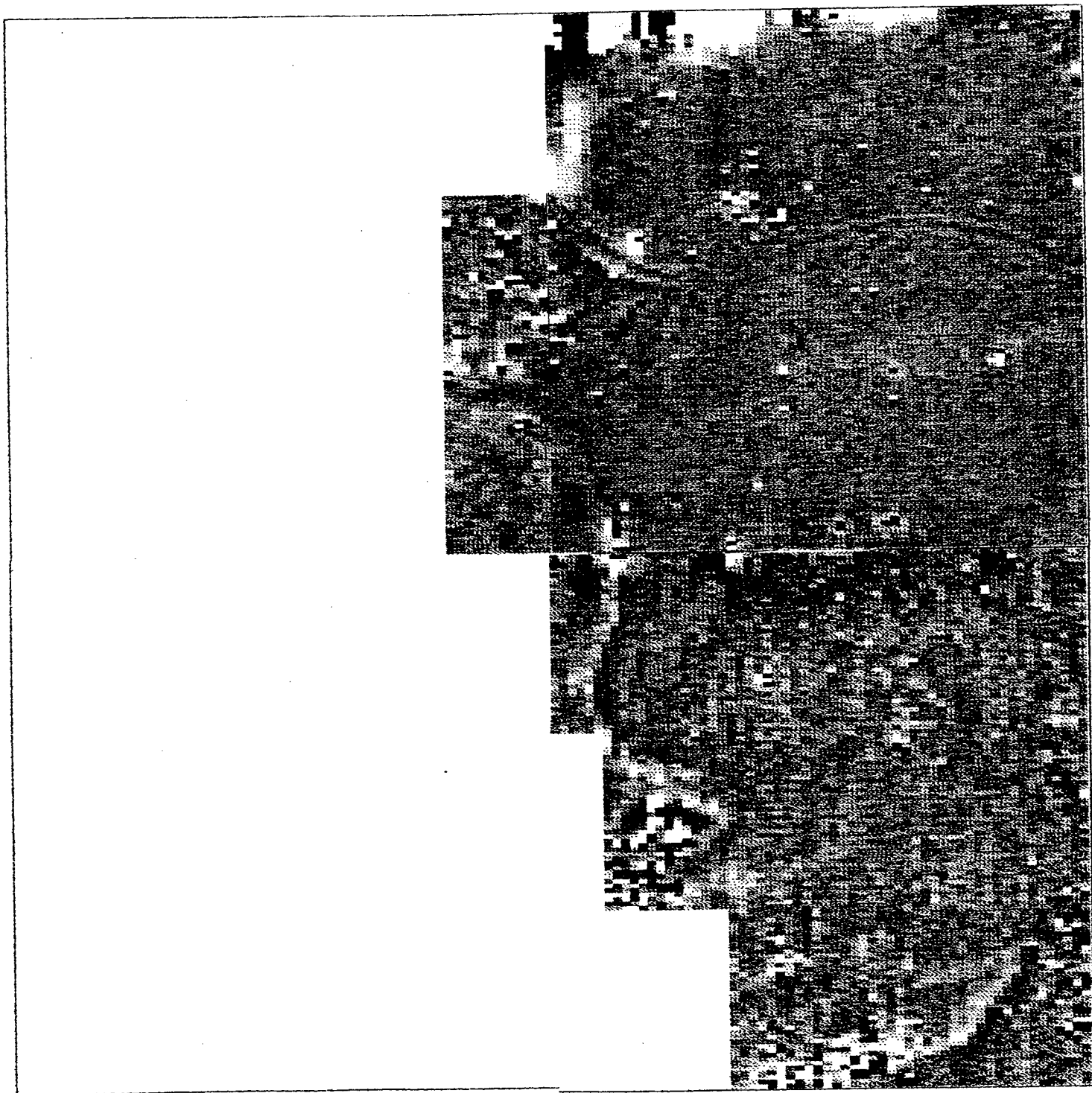


Figure A3. GEOPLOT shade plot of magnetic data.

FORT ELLSWORTH ARCHEOLOGICAL SITE (14EW26-VI)
KANOPOLIS LAKE, ELLSWORTH COUNTY, KANSAS

Magnetic Survey, 25-29 March 1996



Magnetic North

Contour Interval = 0.5 nT

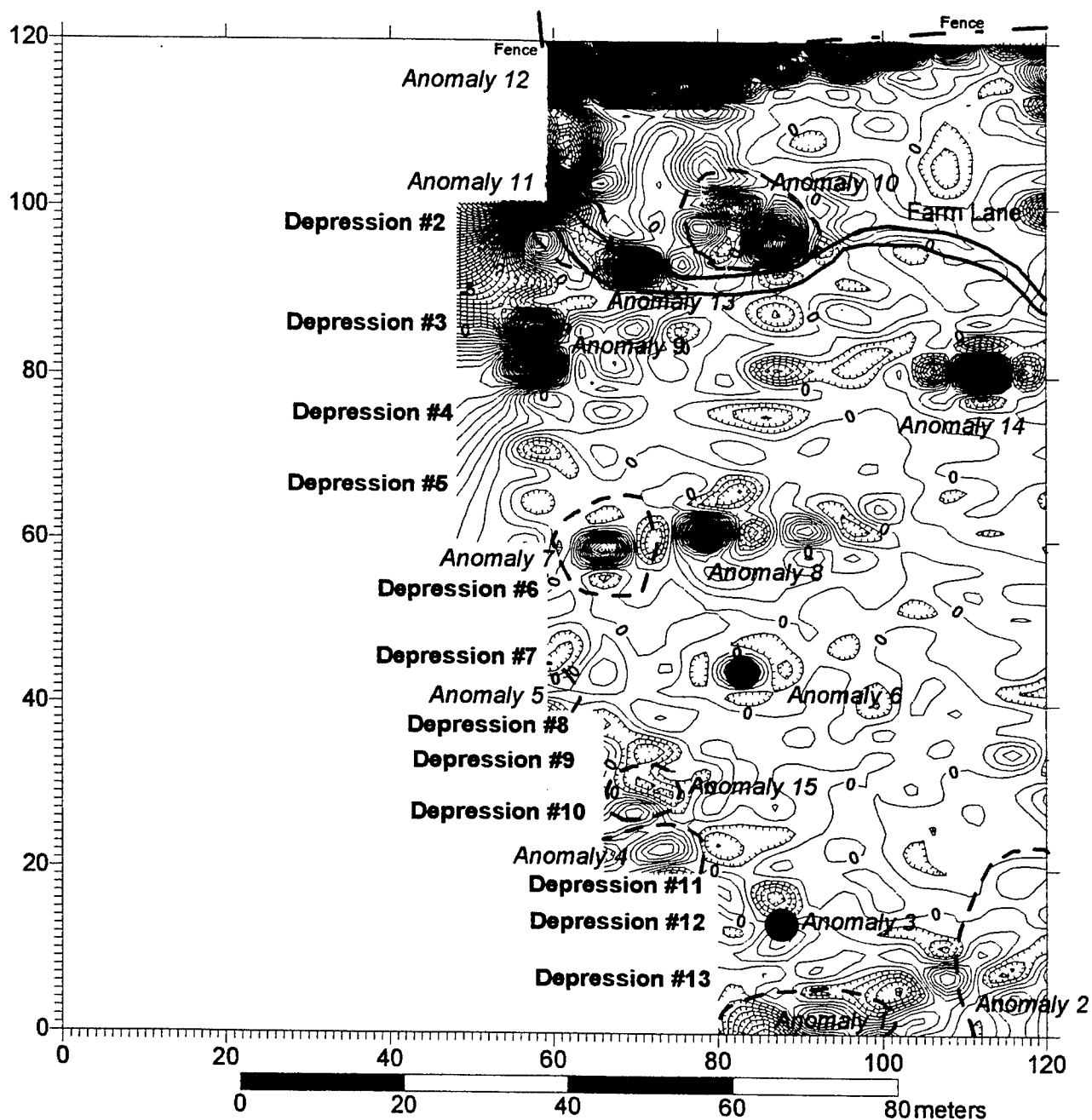


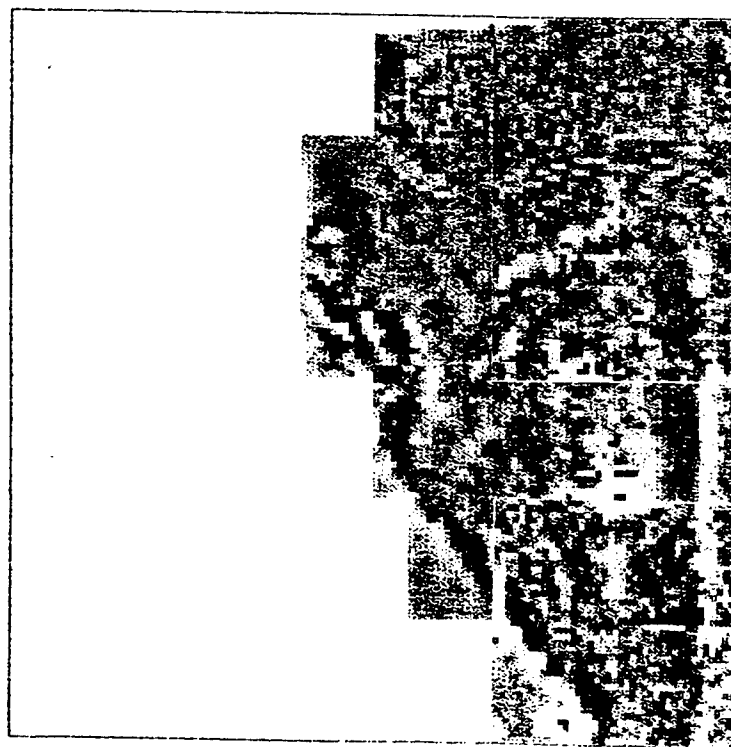
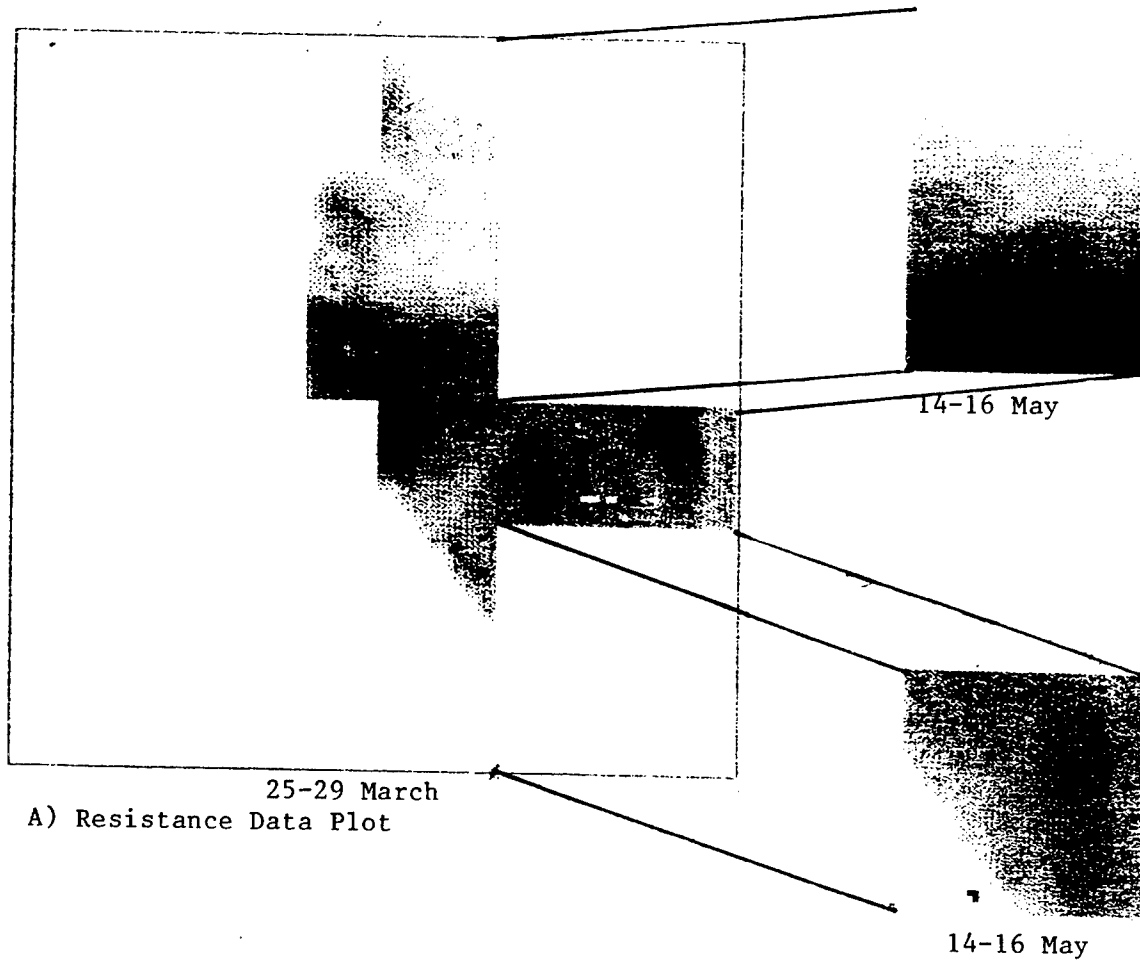
Figure A4. SURFER contour plot of magnetic data.

Resistance Survey

A resistance survey was also conducted at the site. The resistance survey was conducted with a Geoscan Research RM 15 resistance meter and PA5 multi-probe array. The instrument consists of the control unit mounted on the PA5 mobile probe frame. The instrument is also connected to two remote probes by a fifty meter cable. The probes are configured as a twin probe array with one current and one voltage probe located on the PA5 frame and the second set of current and voltage probes located at the end of the cable. The meter was set to take data at 0.5 meter intervals along one meter transverses. The survey was conducted in a zig-zag fashion beginning in the southwest corner of each grid. The distance between the two mobile probes on the frame provides a rough estimated of the depth from which the data is collected. That is the probe setting of 0.5 m provides for approximately 0.5 m depth penetration. The resistance survey encountered several problems including the compact nature of the soil in several locations and the extreme cold weather on the last day. The cold weather apparently affected the nature of the data collected from six grids on the last day of field work. The temperature was below 40 degrees F with a wind chill of 19 to 20 degrees F. The poor data was especially noticeable in the grid which had the COE datum as the southwest corner. A second resistance survey of these six grids and another four grids was conducted latter in the Spring.

The soils within the project area consist of the Jansen sandy loam, 1 to 4 percent slopes and the Wells loam, 1 to 3 percent slopes. The Jansen sandy loam is deep, gently sloping, and well drained. It occurs on the ridgetops and side slopes in upland settings. This soil was formed in loamy sediments over alluvial sand and gravel. This soil mapping unit covers the majority of the site especially the area of the dugouts along the side slope facing the Smoky Hill River. The Wells loam occurs in the northeastern corner of the site. This soil is deep, gently sloping, and well drained. It occurs on side slopes in the uplands. It was formed in material weathered from sandstone and in old alluvium derived from sandstone and sandy shale.

On the ridgetop and the eastern side slope, the resistance values are much higher than the majority of the dugout locations along the western slope facing the river (Figures A5 through A8). The high resistance values are indicative of the sandy type soils (150 to 400 ohms). The previously excavated trench and test units on the ridgetop have extremely higher resistance values due to the use of plastic to line the backfilled units. The plastic acts as an insulator. The dugouts, especially those under the tree canopy have much lower values (in the range of 60 to 120 ohms) due to the litter cover and decomposing organic matter. This has allowed for more soil moisture and better conductivity. On the south side of Depression 13 there is an area of higher resistive values. This are may represent wall cut or wall materials. The magnetic data from the same location also indicated a change which may have resulted from the construction of the dugout or it may be associated with a geological feature associated with the formation of the landform. The rock feature between Depression 13 and 12 is visible in the resistance data. The area of Depression 11 has a similar resistance anomaly to the rock feature in Depression 12. In the area of Depressions 2



B) Resistance Data passed through high pass filter and combined

Figure A5. GEOPLOT shade plot of resistance data before and after high pass filter.

FORT ELLSWORTH ARCHEOLOGICAL SITE (14EW26-VI)
KANOPOLIS LAKE, ELLSWORTH COUNTY, KANSAS

Resistance Survey, 25-29 March 1996

Contour Interval = 5 ohms



Magnetic North

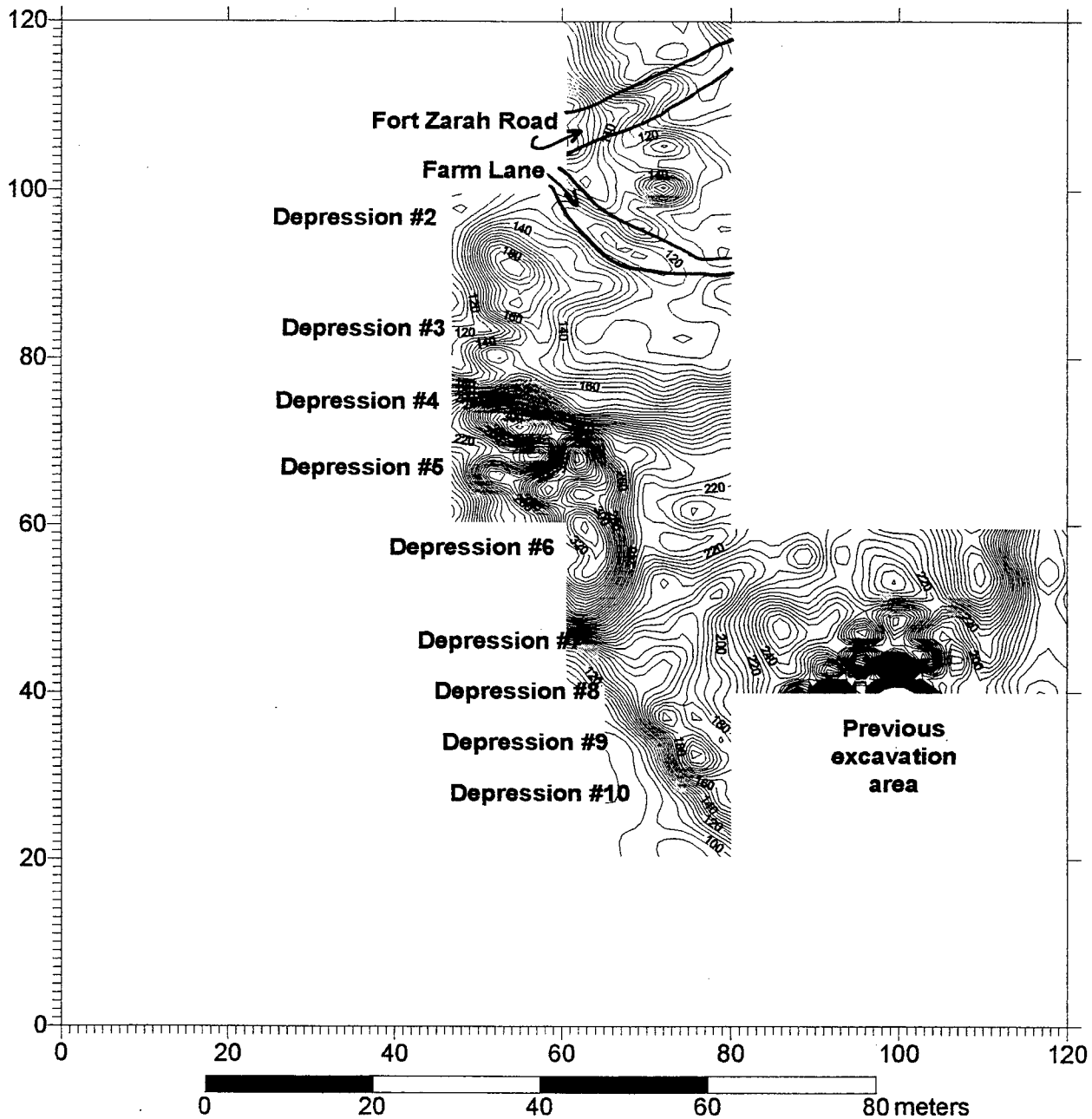


Figure A6. SURFER contour plot of resistance data collected during the week of March 25-29, 1996.

FORT ELLSWORTH ARCHEOLOGICAL SITE (14EW26-VI)
KANOPOLIS LAKE, ELLSWORTH COUNTY, KANSAS

Resistance Survey, 14-16 May 1996

Contour Interval = 5 ohms



Magnetic North

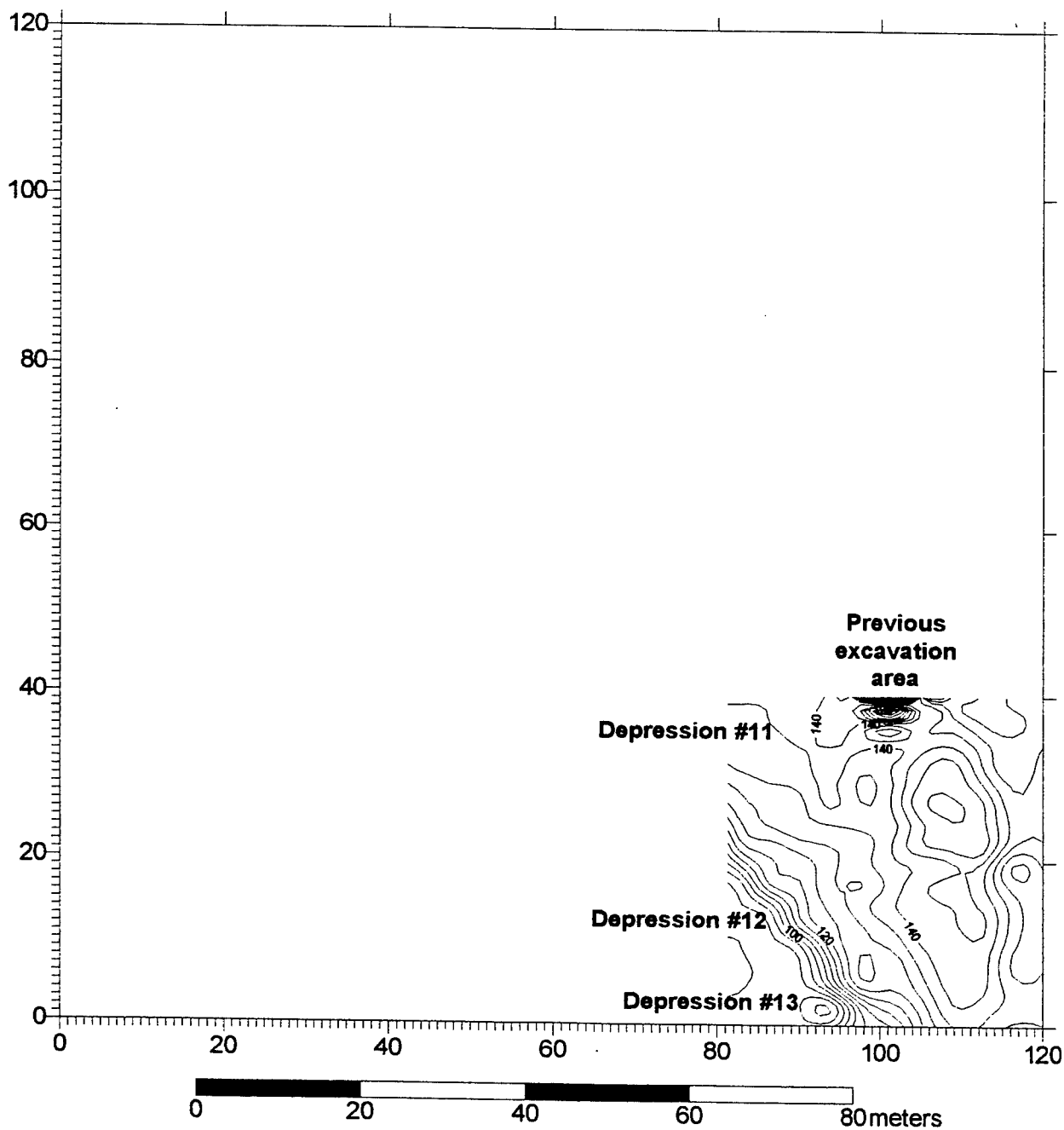


Figure A7. SURFER contour plot of resistance data in southeast corner collected during the period of May 14-16, 1996.

FORT ELLSWORTH ARCHEOLOGICAL SITE (14EW26-VI)
KANOPOLIS LAKE, ELLSWORTH COUNTY, KANSAS

Resistance Survey, 14-16 May 1996

Contour Interval = 5 ohms



Magnetic North

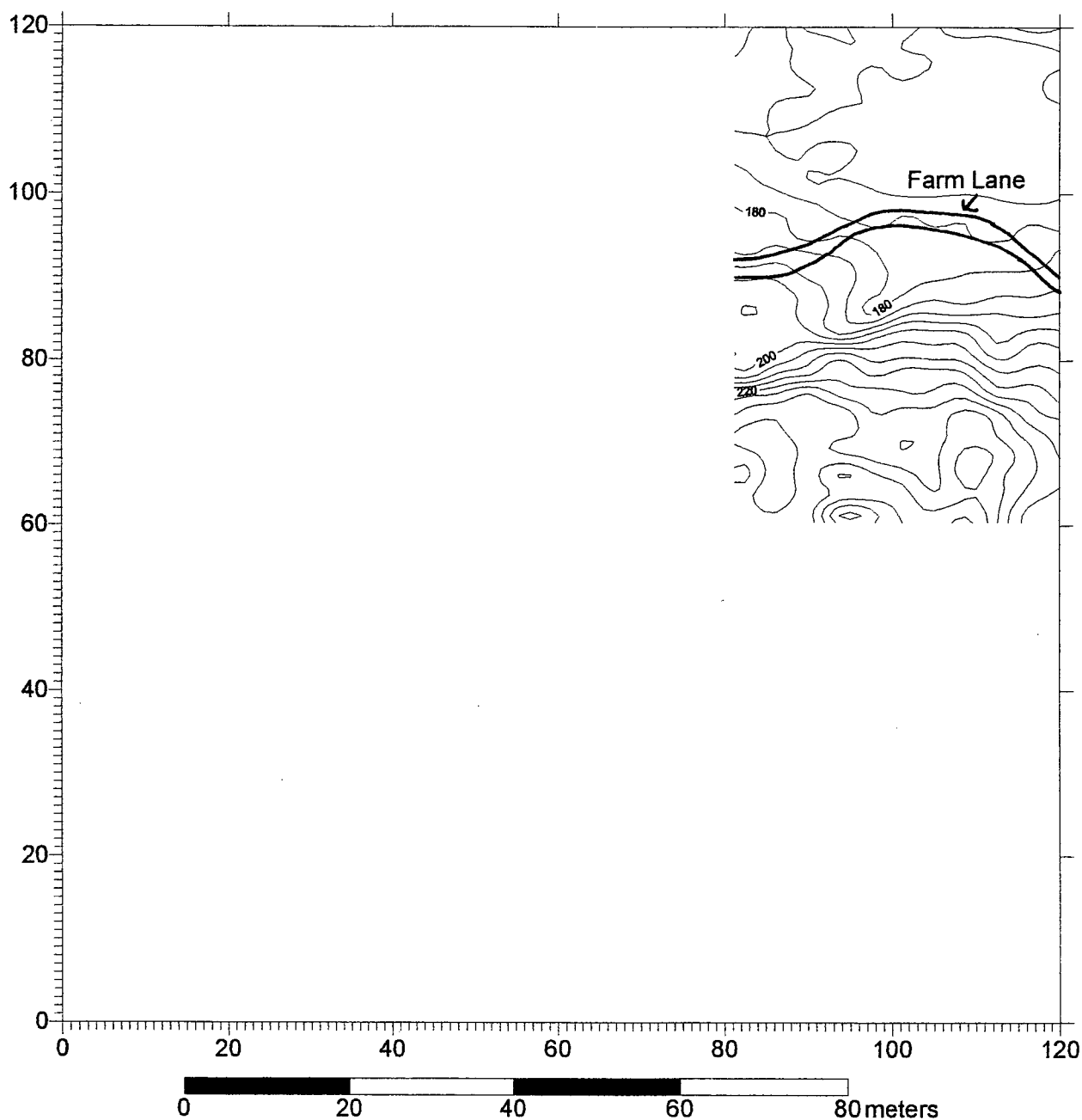


Figure A8. SURFER contour plot of resistance data in northeast corner collected during the period of May 14-16, 1996.

through 7, the resistance values within the dugout locations is slightly less than the values for the unexcavated ridgetop. Depressions 6, 5, 4, and 3 appear to be well defined with lesser values than the surrounding ridgetop. The area identified as Depression 2 appears to have higher resistive values. The farm field road along the northern portion of the site is present on both the Geoplot magnetic and resistance shade plots. In addition, the Fort Zarah Road is identified in the resistance data at the northwest corner of the project area on the north side of the farm lane. The Geoplot data was also passed through a High Pass Filter to provide sharper detail of the resistance data.

Conclusions

The magnetic and resistance surveys of the Fort Ellsworth archeological site provided data about the subsurface cultural features present at the site. Overall, the magnetic data provided substantial data on the nature of the cultural features associated with the site, including the discard behavior of the soldiers stationed at the fort identified with Anomalies 1, 2, and 10 and the interiors of Depressions 13, 12, and 6 associated with Anomalies 1, 3, and 7, respectively. Anomalies 4 and 15 are associated with Depression 10. The resistance data provided less data on the nature of the subsurface features at the site. The resistance data, however, does identify the locations of the farm lane and the Fort Zarah Road in the northern portion of the project area and the disturbed area associated with the excavation units and trenches on the ridgetop.

APPENDIX B

PREHISTORIC ARTIFACTS

by
Richard A. Fox

This appendix summarizes non-Euroamerican artifacts recovered at the Fort Ellsworth site, Locality 6. Artifacts are present in four broad categories - ceramics, projectile points, other tools, and debitage. In total, 142 specimens are described here.

Other artifacts described in the main body of this report (Fox, Chapter 4) are types introduced by Euroamericans to Native Americans of the Great Plains during the late 18th and the 19th centuries. These are two cone tinklers, one brass and the other iron, and 28 seed beads. Other items, such as firearms, were also adopted during the proto-historic and historic eras by natives, but various lines of evidence suggest the vast majority of Fort Ellsworth artifacts were used by non-natives. Thus aboriginal ceramics and lithics likely represent a native presence in the Fort Ellsworth vicinity separate from and earlier than the Euroamerican occupation.

Ceramics

Ceramic sherds number 18, all but one of which are from the bodies of pots. The other is a rimsherd. Without a large sample of rims it is difficult to use pottery as cultural and temporal indicators. Body sherds show only one decoration, cord-wrapped stick impressions. Body sherd attributes (other than paste) are mostly related to surface treatment.

Rimsherd

The single rimsherd is undecorated, and it lacks surface treatment other than smoothing (Figure B1.a). In profile the thickened (braced) rim is straight with a slight outward flare. The edge of the flare is broken away. The specimen came from TU7 at the Knoll.

Body Sherds

Fourteen of the 17 body sherds came from the Knoll-six from TU7, six from TU2 one from TU3, and one from N496 E512. Those from TU7 are plain (undecorated and without surface treatment other than smoothing), although they are quite small (<.1 gram each). The single sherd from TU3 is incised (Figure B1.b), probably below the collar and parallel to it. The incising, though poorly executed, creates hatching which forms diamonds. The same surface treatment is evident on one body sherd from TU2, which also exhibits

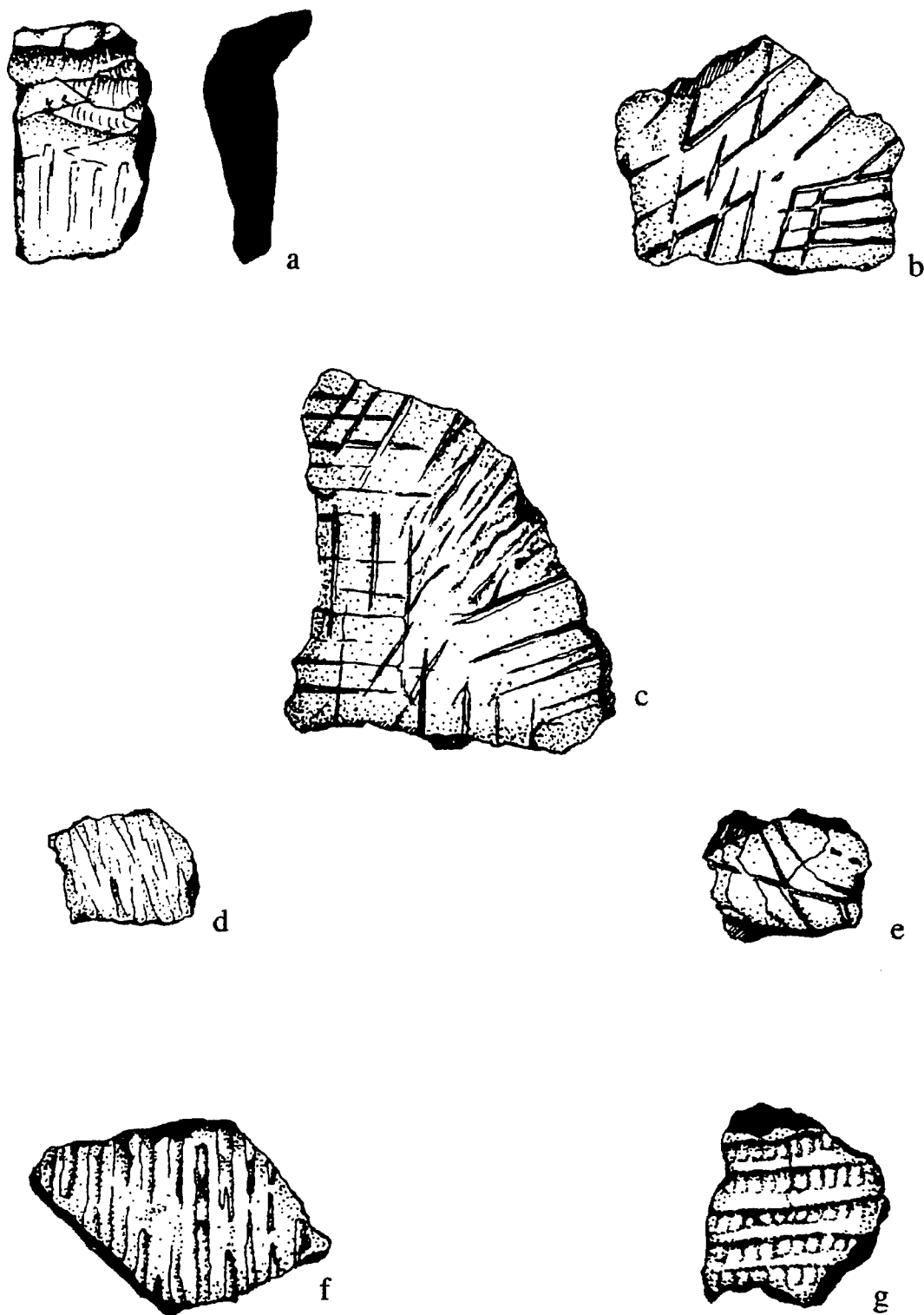


Figure B1. Ceramics. a) rimsherd and profile; b) incised body sherd; c) incised and brushed body sherd; d,e,f) brushed body sherd; g) cord-roughened body sherd (all actual sizes). Fort Ellsworth (14EW26), Locality 6.

faint brushing (Figure B1.c). Three other body sherds from TU2 appear to be lightly to strongly brushed (Figure B1.d-f). Another is a small, nearly split sherd which seems to be incised, and the last TU2 specimen is a tiny sherd that is faintly incised. The final sherd from the Knoll (N496 E512) has surface treatment that appears to be brushing.

Three of the remaining sherds derive from Dugout 10 (Feature 109). Two are cord-wrapped stick impressed (one is shown in Figure B1.g), and the third is faintly marked with an unintelligible treatment.

Lithics

Lithics include projectile points, two flake tools, and debitage - 124 items in total.

Projectile Points

The assemblage includes six projectile points (actually, seven artifacts; two refit to form one point), most of which are incomplete. All derive from the Knoll. Four are from TU4, two are from TU2 and TU3, and one is from N492 E512.

There are three triangular side-notch specimens. Two are made from a pink quartzite. One is nearly complete (two pieces refit), and is close to W.D. Strong's (1935:88) Lost Creek point type NBa1, except the notches are further up the sides (see Figure B2.a). Most of the base is broken from the other pink quartzite point, but it was probably similar to the one just described (Figure B2.b). Another, made from gray chert, is a basal fragment like Strong's type NBa1, but with the notching just a bit further up the sides (Figure B2.c). All four are or were small points, the largest (the two refit specimens) no longer than 2.8 cm.

Another complete but poorly-made point is in white chert (Figure B2.d). This specimen, which is 2.0 cm long, features a very narrow, parallel-sided stem rather than notching. This is Strong's (1935:88) Lost Creek point type SBa. Another specimen is a base fragment from an unnotched triangular point (Strong's [1935:88] Lost Creek point type NBa). It is made of the same gray chert as the notched base.

The tip is broken from another specimen. This is a multiple-notched, triangular point featuring two notches on each side, and a base notch (Figure B2.e). It is also made from a heavily patinated gray chert. Now 2.1 cm long, probably length was originally in the neighborhood of 3.5 to four centimeters. This is Strong's (1935:88) Lost Creek point type NBa3, a type also found east of Kansas and called "Cahokia" by Perino (1968:12, 13).

Other Tools

Other tools are in the form of edge-modified flakes (n=2). A specimen from the Knoll (TU3) might be either a broken endscraper or worked flake (Figure B2.f). The thin specimen

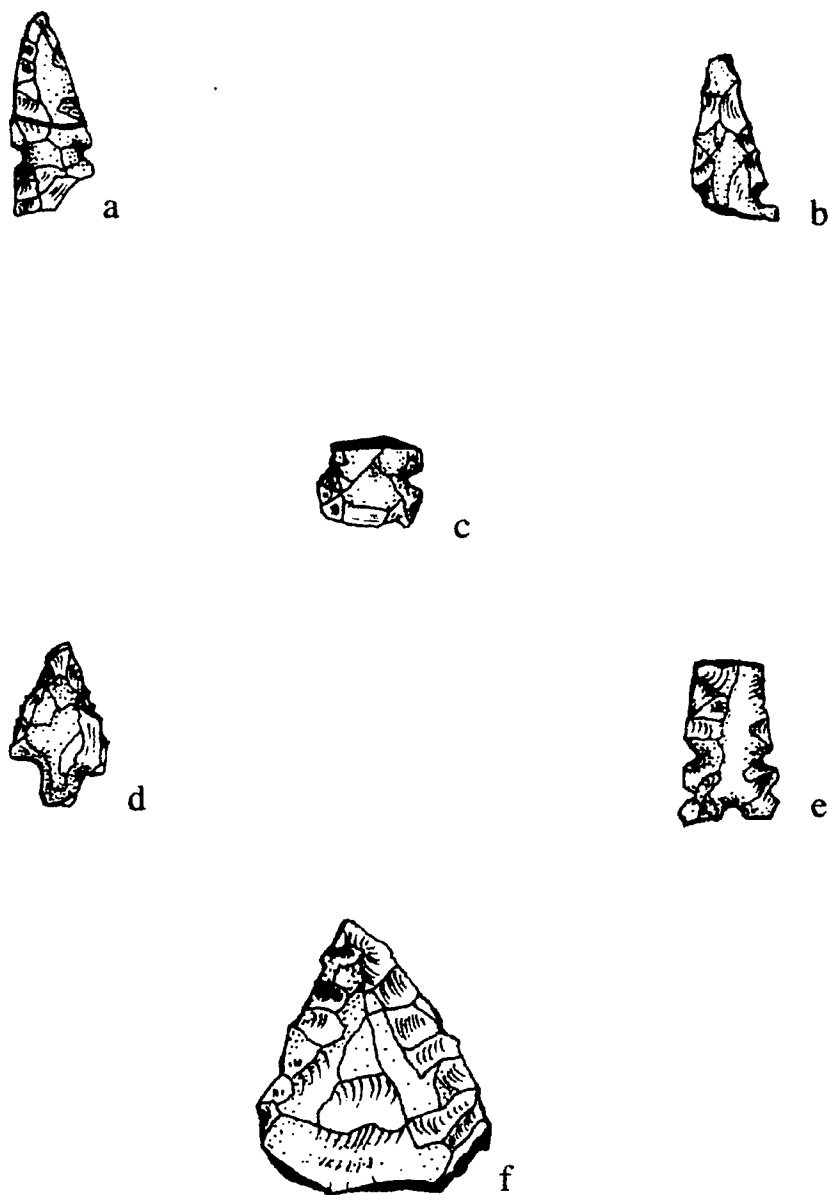


Figure B2. Chipped Stone. a) side-notched pink quartzite; b) side-notched pink quartzite; c) side-notched gray chert; d) stemmed, white chert; e) multi-notched gray chert; f) scraper or worked flake, brown chert (all actual sizes). Fort Ellsworth (14EW26), Locality 6.

exhibits a slightly beveled edge created by pressure flaking. Two edges of a brown chert specimen from N496 E512 on the Knoll, triangular in shape, have been slightly modified, perhaps to form a cutting edge.

Debitage

Debitage (n=115) derives from three locations. Most specimens are from the Knoll (n=111); a few were found at Dugout 13 (n=1) and the Flats (n=3). During examination of thedebitage, nine pebbles were found to be unmodified, and were discarded. They are not counted here.

Tertiary flakes from the Knoll (n=41) are most numerous, outnumbering primary (n=37), secondary (n=26), and shatter (n=7). Another Knoll specimen with the lithicdebitage, but not counted, is a small spall from a shell, probably a freshwater shellfish.

Three flakes were recovered from the Flats. They include two tertiary flakes and one secondary. The single specimen found at Depression 13 (Feature 113) is a tertiary flake.

Tertiary flakes predominate overall, numbering 44. Next are primary flakes (n=37), followed by secondary flakes (n=27), and shatter (n=7). This distribution more or less suggests that lithic reduction at the site included the early stages and later stages of tool manufacture. An absence of microdebitage is assumed to be a function of recovery techniques.

Debitage raw material is not too varied. Mostly it is chert in various colors, followed in quantity by quartzites and chalcedonies, including agate. Cryptocrystalline rock appears to be absent. In short,debitage includes mostly materials that could be obtained locally.

Cultural and Temporal Affiliations

Several factors render somewhat shaky any pronouncements on the cultural and temporal affiliations of the prehistoric material from Locality 6. Paramount is the lack of associated features. Also contributing is the scant nature of the assemblage, particularly the ceramic assemblage and its near dearth of rimsherds. Both of these factors are the result of investigations which were designed to investigate the historic component, not prehistoric occupations.

Nonetheless, based on ceramics either a Smoky Hill or Upper Republican phase affiliation seems likely. Braced rims are an attribute of ceramics (Frontier ware) assigned to Upper Republican (Sigstad 1969:17-18), as are plain or smoothed bodies (Wedel 1986:106). Incised hatching forming triangles is one characteristic of Smoky Hill ceramics, which can also have braced rims (O'Brien 1994:215). Cord-roughened pottery - Riley cord-roughened - is also associated with the Smoky Hill phase (Butler and Hoffman 1992:60). While it is the

predominant Smoky Hill surface treatment, cord marks were usually applied haphazardly (Witty 1978:57), which is in any case unlike the cord impressed body sherd treated here.

Projectile points reported here are typical of either phase. Small triangular points, usually side-notched, are the most common form in Upper Republican sites (Wedel 1986:108). Smoky Hill lithics are generally like those of the other Central Plains Tradition phases (O'Brien 1994:215).

Radiocarbon dates, excluding some outliers, place the Smoky Hill phase in the period AD 1000 to AD 1300. The Upper Republican timeframe, also based on carbon dates, is thought to be slightly later, from AD 1100 to AD 1400 (O'Brien 1994:213, 215). Wedel suggests that Smoky Hill was the source for Upper Republican (O'Brien 1994:215), which of course would account for some material similarities between the two phases.

While the Fort Ellsworth aboriginal materials might be assigned to either phase, their geographical provenance suggests Smoky Hill as the most likely affiliation. Upper Republican sites are distributed generally north of the Smoky Hill River, beyond the Fort Ellsworth area. The Smoky Hill heartland, however, includes the Fort Ellsworth area, and it extends eastward along the lower reaches of Smoky Hill River.

APPENDIX C

IDENTIFICATION OF HUMAN REMAINS

by

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C O N F I D E N T I A L

U.S. Army Corps of Engineers, Kansas City District
ATTN: Dr. Robert Ziegler (EP-PR)
700 Federal Building
Kansas City, Missouri 64106

Osteological Report - OL98-09 for USACE, Kansas City.

Summary: These remains, originating in Ellsworth County, Kansas, represent an adult individual of osteologically indeterminate sex and ancestry. MNI = 1.

I. Introduction: Following the "Scope-of-Work" [(Identification of Human Remains from the Site of Fort Ellsworth (14EW26, Locality, VI)]" received by FAX 1 May 1998, I received skeletal materials on 5 May 1998 from Mr. Randy Thies of the Kansas State Historical Society, Topeka. These materials had originated in Ellsworth County, Kansas (14EW26).

II. Bones present:

1. 14EW26-24 TU4 N480 E540 The distal half of a right proximal 2nd or 3rd phalanx, broken and eroded. Three unidentified pieces (two of which articulate) of mammal bone. This is not human! Probably ungulate; consistent in size with *Bos* & *Bison* sp.
2. 14EW26-27 TU4 N480 E540 A left navicular (scaphoid) and one smaller unidentified bone fragment. Morphologically it could be part of another carpal bone. Probably human.
3. 14EW26-32 TU4 N480 E540 Three fragments. Largest piece appears to be the proximal third of a left second metacarpal, much eroded. The mid-sized fragment is unidentified, but probably represents a portion of one of the carpals. The third slender fragment is unidentified and may or may not be human.
4. 14EW26-39 TU4 N482.8 E543.8 An incomplete 2nd--5th middle finger phalanx, side undetermined due to postmortem breakage.
5. 14EW26-46 TU5 N455 E560 Lower left canine (#22). Occlusal wear. Mild enamel hypoplasia at proximal third of crown; possibly incurred at an age of 3-4 years.
6. 14EW26-47 TU5 N455 E560 Upper right central incisor (#8). Occlusal wear.
7. 14EW26-49 TU5 N457.5 E560 (N 1/2) Right proximal 2nd or third toe phalanx. Proximal epiphyseal plate recently fused or differential erosion at the epiphyseal line. Suggests a younger individual--if female, a little older than 15 years; if male, a little older than 17 years.

8. 14EW26-58 TU7 N430 E565 (NE 1/4) A right 2nd or 3rd proximal finger phalanx. A 2nd--4th distal right finger phalanx. Four pieces of thoracic vertebrae (1-6th), adult, may represent more than one vertebra. Three unidentified fragments, probably human.

9. 14EW26-59 TU7 N430 E565 (NE 1/4) A 1st right rib. Adult. A vertebral fragment, not further identified.

III. Condition: Variable poor to good. Postmortem breakage, exfoliation and loss of finer morphology.

IV. Pathological condition: Unexceptional.

V. Anomalies: Unexceptional.

VI. Trauma: Postmortem breakage.

VII. Age: Generally adult (older than 15 if female 17 if male) for the youngest remains. This is supported by dental attrition (Brothwell 1981 and 1987).

VIII. Sex: Osteologically indeterminate. The limited, extant morphology is consistent with either sex.

IX. Race: Indeterminate due to the paucity of remains.

X. Stature: Indeterminate.

XI. Time of death: Indeterminate.

XII. Cause of death: Indeterminate.

XIII. X-rays: None required.

XIV. Identification: No identification is suggested.

XV. Recommendation: No parts are duplicated and there is no definitive age or sex discrepancy. A MNI of one is suggested. The incisor tooth is not shoveled, but that does not eliminate the possibility of a Mongoloid. I recommend that ancestry be based on cultural remains at the site consistent with the levels of the excavated bone remains.

XVI. These remains will be returned on demand to USACE for their disposition. Please contact me with instructions on the return of these skeletal remains.

Respectfully submitted,


Michael Finnegan

Date: 7 May 1998

APPENDIX D

**LOCATIONS OF 1995-1996 ARTIFACTS BY MAJOR
PROVENIENCES**

by
Richard A. Fox

(Counts for objects; weights in grams for bulk items)

	Dugout 10	Dugout 13	Met Det	Surf. Gen.	Surf. T-Cut	Surf. Loc5	TU 1	TU 2	TU 3	TU 4	TU 5	TU 6	TU 7	TU 8	496N 512E	492N 512E	446N 530E	440N 501E	Trench 1
CONSTRUCTION																			
Brick w/mortar	8																		
Brick frags	136	9																	
Mortar	622g	178.9g								69g	33g								
Mortar and lime	321.7g																		23.8g
Mortar or sand congl.										22g					0.7g				
Mortar w/window glass	12.2g																		
Lime	123.8g	243.7g	6.4g							2.0g									1.4g
Fieldstone w/mortar		60.4g																	
Fieldstone	3.25kg	360g																	
Sheet metal strap	6	18	30																
Sheet metal frags	30	106	29																
Window glass	178	143	8		2														
Window glass, melted	31		1																
Wind. glass, melt w/mortar	1																		
HARDWARE																			
Nails																			
Cut common, complete	356	404	108				4	1		5	1		1	37	1	1	3		
Cut, incomplete	499	530	127		10			1		3		1		42	3		9		4
Cut spikes	26	13	2																
Cut finish, complete	20	42																	
Cut finish, incomplete	4	18																	
Cut clinch	7																		
Cut box		1																	

	Dugout 10	Dugout 13	Met Det	Surf. Gen.	Surf. T-Cut	Surf. Loc5	TU 1	TU 2	TU 3	TU 4	TU 5	TU 6	TU 7	TU 8	496N 512E	492N 512E	446N 530E	440N 501E	Trnch 1
Nails (continued)																			
Wire common			4																
Tacks																			
Cut square head	7	15	1											1					
Cut carpet		10																	
Decorative			1														2		
Horseshoe nails	5	6	8																
Wire brad	1																2		
Staples																			
Fence	1		2																
Square, rect	2	2																	
Heavy duty											1								
Wood screws	12	6	1																
Nut	1																		
Bolts																			
Machine w/ & w/o nut	1		2																
Lag w/ & w/o nut		1	3																
Pin	1																		
Washers	1		2							1									
Spacer	1																		
Rivets/burs	24	1																	
Animal traps			2																
Animal shoes	1	2	4																
Lockset part			1																

	Dugout 10	Dugout 13	Met Det	Surf. Gen.	Surf. T-Cut	Surf. Loc5	TU 1	TU 2	TU 3	TU 4	TU 5	TU 6	TU 7	TU 8	496N 512E	492N 512E	446N 530E	440N 501E	Tmch 1
HARDWARE (con't)																			
Trunk strap, decorative end	1																		
Trunk lockplate			1																
Wagon hardware																			
Bow staples	3																		
Box stay		1																	
Stay rivet, hand-forged		1																	
Tongue collar (?)	1																		
Buckles																			
Hartshorn		2																	
Roller	3	1	1																
Center-bar			2																
D-shaped		1																	
Rings																			
Rectangular	2																		
O-rings	6	1	1																
D-rings	1		1																
Wire	3	1	1		1														
Stove plate	1	1																	
Grate		1																	
Hinges																			
Rectangular butt, frags	4																		
Pintel	1		1																
Chain repair link	1																		

	Dugout 10	Dugout 13	Met Det	Surf. Gen.	Surf. T-Cut	Surf. Loc5	TU 1	TU 2	TU 3	TU 4	TU 5	TU 6	TU 7	TU 8	496N 512E	492N 512E	446N 530E	440N 501E	Trinch 1
HARDWARE (con't)																			
"Screen door" spring			1																
Tubing	1 (brass)	1 (iron)																	
Meat hook, to-drive	1																		
Lamp chimney glass	12	49	4																
Barrel hoop		1																	
Pail, partial		1																	
Round iron stock; modified																			
Spindle			1																
1/3" beveled rod		4																	
.22" beveled rod			2																
Eyed rod		1																	
Gate hook?	1																		
Omega-shaped			1																
Round iron stock; unmod	4	1	3																
Flat iron stock; modified																			
13" strap iron			1																
Curvilinear		1																	
Flat iron stock; unmodified	1	6	8																
Unidentified hardware																			
Items in Plates 6, 7	1	3	1								Pl17								
Flat spring		1																	

	Dugout 10	Dugout 13	Met Det	Surf. Gen.	Surf. T-Cut	Surf. Loc5	TU 1	TU 2	TU 3	TU 4	TU 5	TU 6	TU 7	TU 8	496N 512E	492N 512E	446N 530E	440N 501E	Trmch 1
MILIT. EQUIP. ACCOUNT																			
Springfield appendage		1																	
Sabre hook			1																
Sabre hook D-ring			1																
Canteen																			
Partial		1	1																
Stoppers	1		1																
Shoulder scale wing stud		1																	
Knapsack adjustment hook	1																		
Triangular ring	1																		
Belt catch		1																	
Strap hooks	1	1																	
Strap studs	8																		
Insignia																			
Hat eagle? frag		1																	
Regimental 7		1																	
Line eagle buttons	5		4							1									
Saddle guard plate	1																		
AMMUNITION & ITEMS																			
Cartridge cases																			
Fragments	1	1	2																
Spencer, no headstamp	1									2									
Spencer, S.A.W.	3		1																
Spencer, FVV & Co.			2																

Cartridge cases (con't)	Dugout 10	Dugout 13	Met Det	Surf. Gen.	Surf. T-Cut	Surf. Loc5	TU 1	TU 2	TU 3	TU 4	TU 5	TU 6	TU 7	TU 8	496N 512E	492N 512E	446N 530E	440N 501E	Trnch 1
Gallager		1	6																
22 Hornet		1																	
22 U headstamp			1																
22 F headstamp	1																		
22 Ili Speed	1																		
22 short		1											1						
44 rimfire (Henry?)			1																
Shotshells																			
New Club		1																	
Western Field			1																
Nitro Express			1																
Winchester Western			1																
Made in USA			1																
Primers																			
Top hat	2	3	1										1						1
Cup	1	2																	
Bullets																			
Frag, mushroom, sliced	4	1	7																
Ball			1																
22 caliber		1	1																
25 caliber			1																
36 to 38 caliber	3		1																
Special, Magnum			2																

	Dugout 10	Dugout 13	Met Det	Surf. Gen.	Surf. T-Cut	Surf. Loc5	TU 1	TU 2	TU 3	TU 4	TU 5	TU 6	TU 7	TU 8	496N 512E	492N 512E	446N 530E	440N 501E	Trench 1
Bullets (con't)																			
44 caliber	2	1	3																
Picket	1																		
50, 52 Merrill			1																
Gallager			1																
56 to 58 caliber	7	2																	
Jacket bullets			11																
Lead shot bar frags	6																		
Sprue, other lead	1	5	6		1														
APPAREL & ACCOUNT																			
Buttons																			
Milk glass	6	5														1			
Shell	2	1																	
Iron. 2-pc pressed	4	14			1												1		
Brass, 2-pc pressed			1																
Shank	3	2																	
NR Co hard rubber	3																		
Pewter	1	1																	
Iron, 1-pc pressed	1	1																	
Rubberized cloth frags	~135g	2g																	
Buckles, Hartshorn		2																	
Hook&eye hook	0,2	1																	
Grommets	2	3	2																

	Dugout 10	Dugout 13	Met Det	Surf. Gen.	Surf. T-Cut	Surf. Loc5	TU 1	TU 2	TU 3	TU 4	TU 5	TU 6	TU 7	TU 8	496N 512E	492N 512E	446N 530E	440N 501E	Trinch 1
APPAREL (cont)																			
Footwear																			
Heel frags	1	2																	
Toe frag	1																		
Heel/toe plates	2																		
Shoe nails, loose	5																		
Eyelets	11																		
PERSONAL ITEMS																			
Sewing paraphernalia																			
Thimble	1																		
Sail/packing needle		1																	
Straight pins	4	2	1																
Chalk, tailor?	1																		
Writing instruments																			
Pen nib frag		1																	
Pencil lead frag	1																		
Pen/pencil frags	1	1																	
Jewelry																			
Ring, NRCO button		1																	
Wedding band			1																
Bead	28	1													2				
Cone tinklers	1 (brass)	1 (iron)																	
Concha	1																		

	Dugout 10	Dugout 13	Met Det	Surf. Gen.	Surf. T-Cut	Surf. Loc5	TU 1	TU 2	TU 3	TU 4	TU 5	TU 6	TU 7	TU 8	496N 512E	492N 512E	446N 530E	440N 501E	Trnch 1
PERSONAL ITEMS (con't)																			
Coins																			
1865 Indian Head		1																	
1968D Lincoln			1																
Coin Purse frame frags	2																		
Smoking pipe sherds		9																	
Grooming items																			
Brush handle	1																		
Bobby pin	1																		
Mirror sherds	2																		
Eating/Cooking items																			
Flatware																			
Knives		2	3	1															
Forks	1	1									1								
Spoons	1	7																	
Iron hollowware																			
Pot, cup handles	3	1	1																
Mucket			1																
Strainer, homemade			1																
Strainer, mass produce		1																	
Roast/bake pan	1																		
Pan/pot lug			1																
Other hollowware																			
Pewter leg	1																		

	Dugout 10	Dugout 13	Met Det	Surf. Gen.	Surf. T-Cut	Surf. Loc5	TU 1	TU 2	TU 3	TU 4	TU 5	TU 6	TU 7	TU 8	496N 512E	492N 512E	446N 530E	440N 501E	Trinch 1
Folding Knives, Jacks																			
Premium, DE monogra			1																
Boy's jack			1																
w/ punch open	1																		
Blade, minus body			1																
Hunting knife	1																		
CERAMICS																			
Earthenware sherd		1																	
White ware sherds	1																		
Body	14	9	3		1														
Rim	7	8	1																
Lug	1																		
Knob	1																		
Coaster	1																		
Base ring	1																		
CONTAINERS: TIN CANS																			
Cans, parts - lapped seams	3	6	145		2									1					
Can parts, locked seams			2																
Can frags	3	35	23												2		4		
Can caps	5		24																
Can ends		15	51		2														
Can strips		12																	

	Dugout 10	Dugout 13	Met Det	Surf. Gen.	Surf. T-Cut	Surf. Loc5	TU 1	TU 2	TU 3	TU 4	TU 5	TU 6	TU 7	TU 8	446N 530E	440N 501E	Trinch 1
TIN CANS (con't)																	
Can lids	3		2														
Can, hole-in-top frags			6														
US Tobacco lid														1			
Chaigneau sardine		1															
Can parts, sardine		1	10														
Can, cone-top			1														
Can frags, w/contents		21															
Square, w/contents	1																
CONTAINERS: GLASS																	
Bottles																	
C.H. Swain bitters		1															
Perfume/prescript	1																
Peppersauce		1															
Conical ink		1															
Embossed sherds (1Ded)																	
Kelly's Old Cabin		12															
Henry C. Kellogg		6															
Barnhart & Kelly		2															
Mex Mustang Liniment		8															
C.H. Swain bitters		6															
Davis' Painkiller	4																
			1														

	Dugout 10	Dugout 13	Met Det	Surf. Gen.	Surf. T- Cut	Surf. Loc5	TU 1	TU 2	TU 3	TU 4	TU 5	TU 6	TU 7	TU 8	496N 512E	492N 512E	446N 530E	440N 501E	Tmch 1
Bottles (con't)																			
Embossed sherds (UNID)																			
...G	1																		
Unintelligible		1																	
...ELLO... (?)		1																	
...RE SAU(C)...		2																	
Decorative Bottle Sherds																			
Gothic pickle		456																	
Gothic peppersauce		1																	
Barrel		99																	
Fluted	1	56																	
Body sherds	120	792			8	2				1							38		1
OTHER GLASS																			
Other Embossed Sherds																			
...G	1																		
Unintelligible		1																	
...ELLO... (?)		1																	
...RE SAU(C)...		2																	
Other Decorated Sherds																			
Elf figure			1																
Vine and bud																	44		
Diamond pattern			1																

	Dugout 10	Dugout 13	Met Det	Surf. Gen.	Surf. T-Cut	Surf. Loc5	TU 1	TU 2	TU 3	TU 4	TU 5	TU 6	TU 7	TU 8	496N 512E	492N 512E	446N 530E	440N 501E	Trmh 1
Other Decor Sherds (con't)																			
Ridge and valley		1																	
Etched		2																	
Pressed line		1																	
Molded ridge		3																	
Bottle stoppers	1, molded	1, frosted																	
Bottle necks/finishes	1	16																	
Bottle bases & base sherds	6	27	1													1			
OTHER METAL																			
Ferrous																			
Strip, folded edges			1																
Amorphous cast iron			4																
Amorphous iron frags		7																	
Rust conglomerate		1																	
Cuprous																			
Ornamental band			1																
Shield-like object		1																	
Threaded brass cap		1																	
Short tubular ferrule?	1																		
Patent April ?, 18??		1																	
Amorphous frag		1																	

PLATES

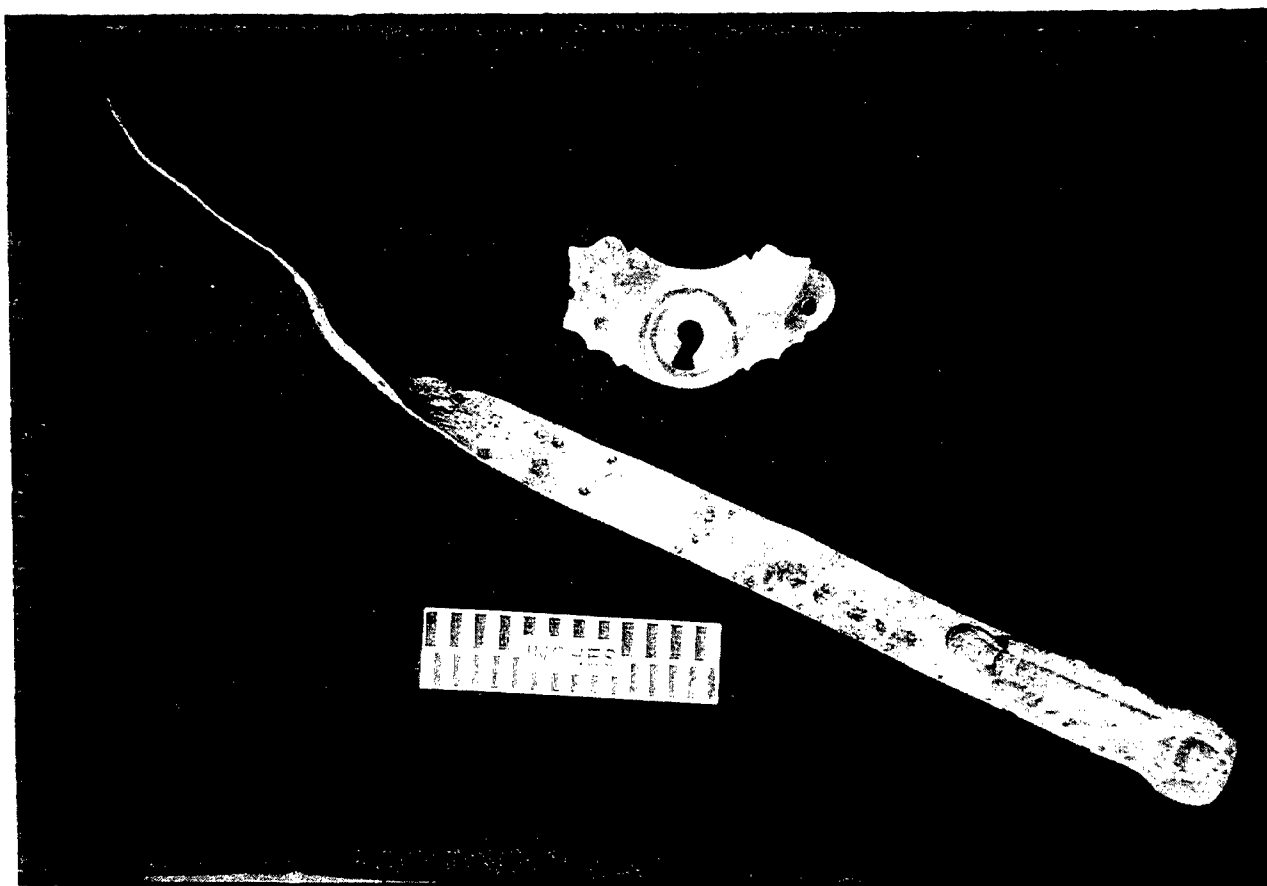


Plate 1. Trunk furniture: Above, trunk lockplate; Below, trunk (?) strap. Fort Ellsworth (14EW26), Locality 6 (3-inch scale).



Plate 2. Closeup, obverse of trunk strap. Fort Ellsworth (14EW26), Locality 6 (3-inch scale).

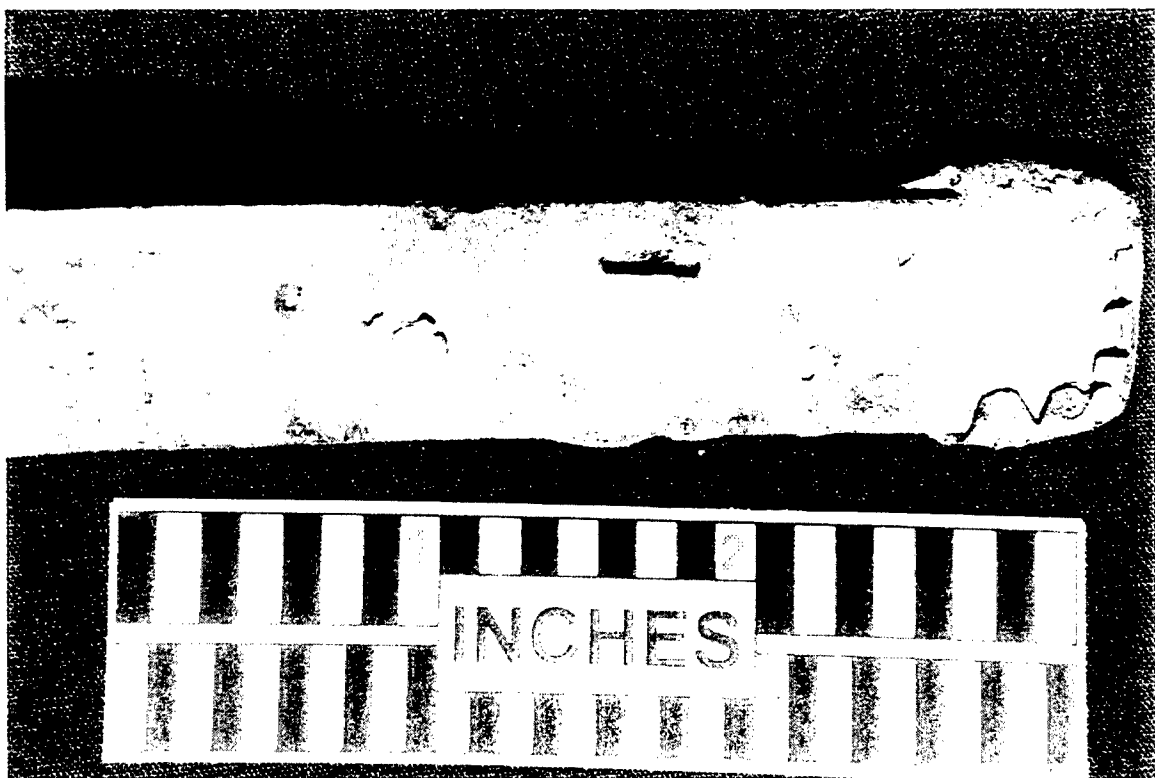


Plate 3. Closeup, reverse of trunk strap ornamental end. Fort Ellsworth (14EW26), Locality 6 (3-inch scale).

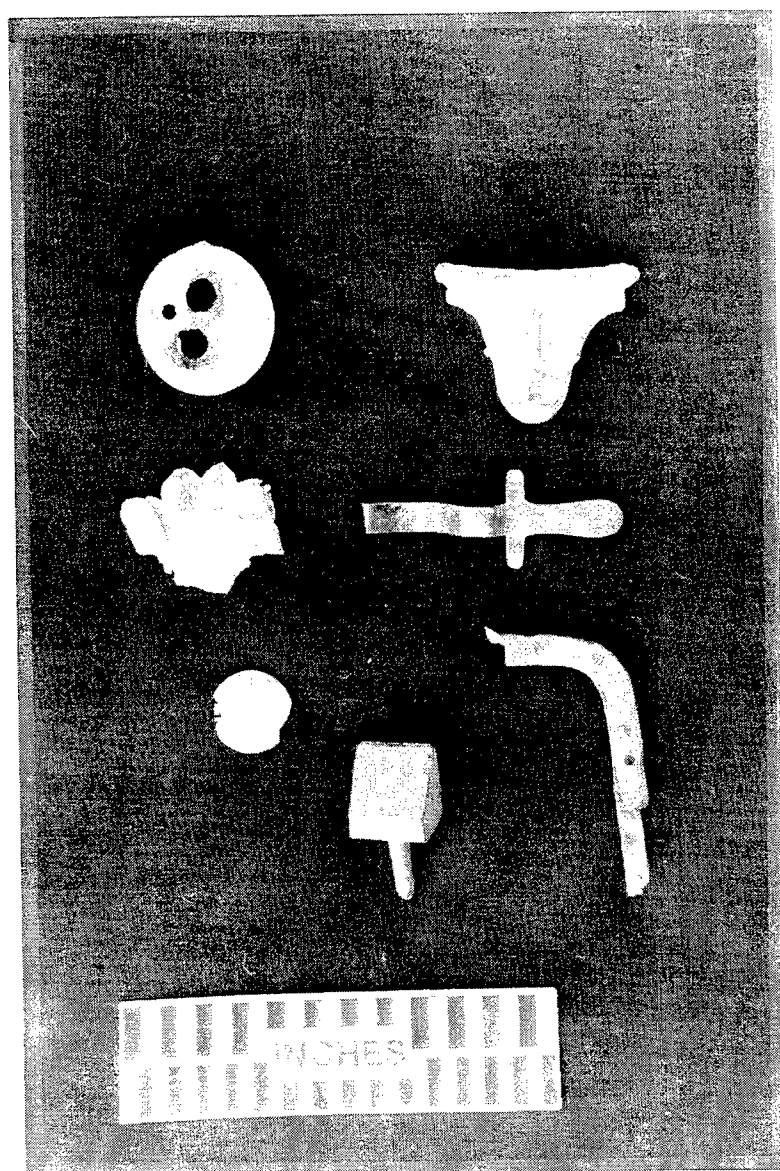


Plate 4. Fort Ellsworth (14EW26), Locality 6 artifacts (3-inch scale).

Top row (l-r) - unidentified screw-on cap, brass; ornamental leg to urn or bowl, pewter.

Middle row (l-r) - fragment from hat eagle (?) insignia, stamped brass; unidentified brass object stamped PATD \PRIL ?.18??.

Bottom row (l-r) - unidentified object, stamped brass; lockset catch (?), ferrous; part of coin purse frame, ferrous (see also Plate 9).

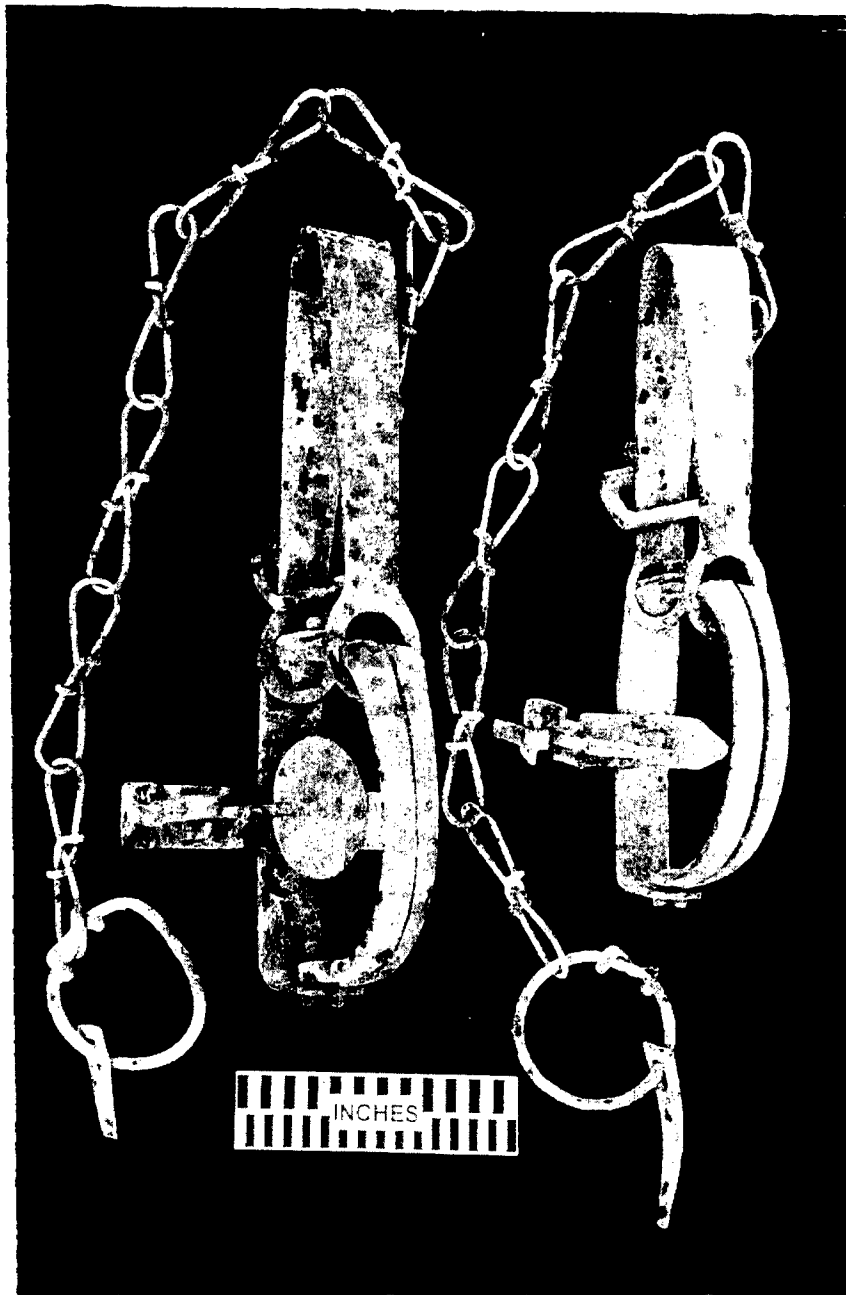


Plate 5. Single spring (long) leg-hold steel traps. Fort Ellsworth (14EW26), Locality 6 (3-inch scale).

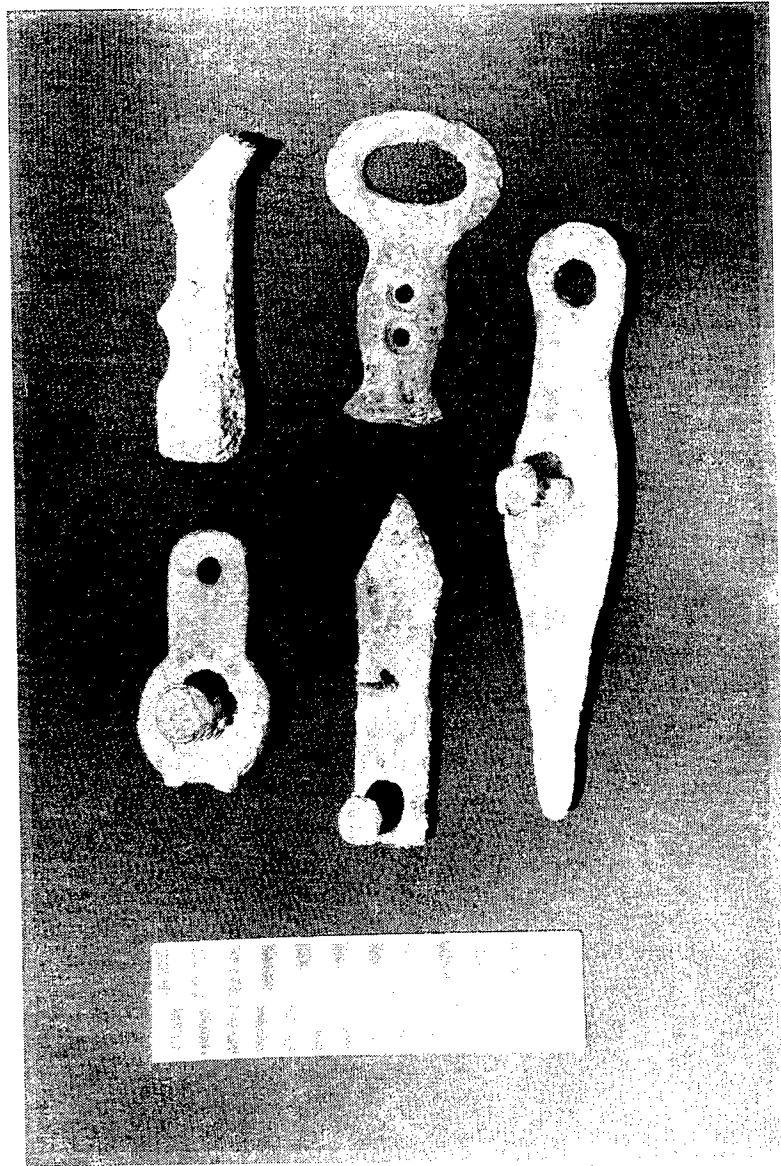


Plate 6. Unidentified ferrous hardware objects. Fort Ellsworth (14EW26), Locality 6 (3-inch scale).

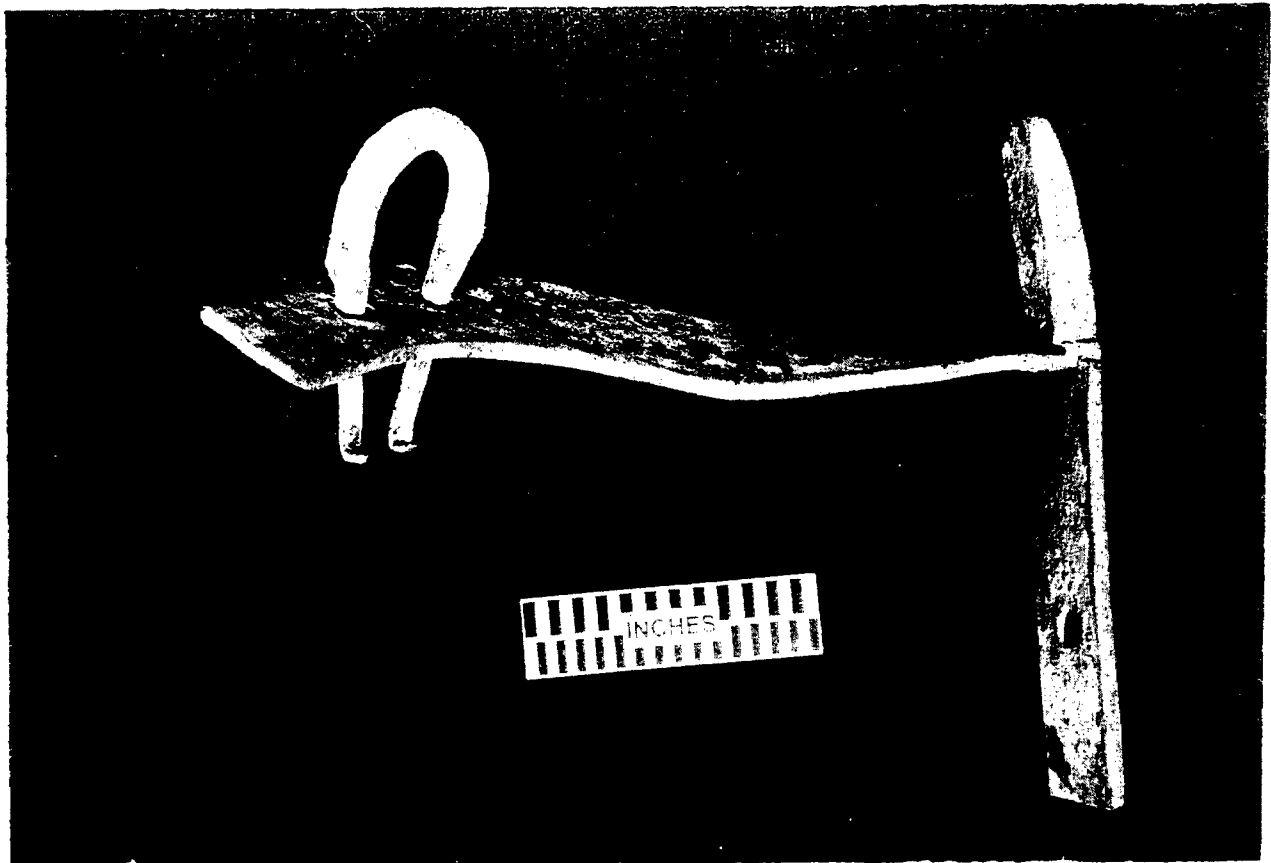


Plate 7. Unidentified ferrous hardware object. Fort Ellsworth (14EW26), Locality 6 (3-inch scale).

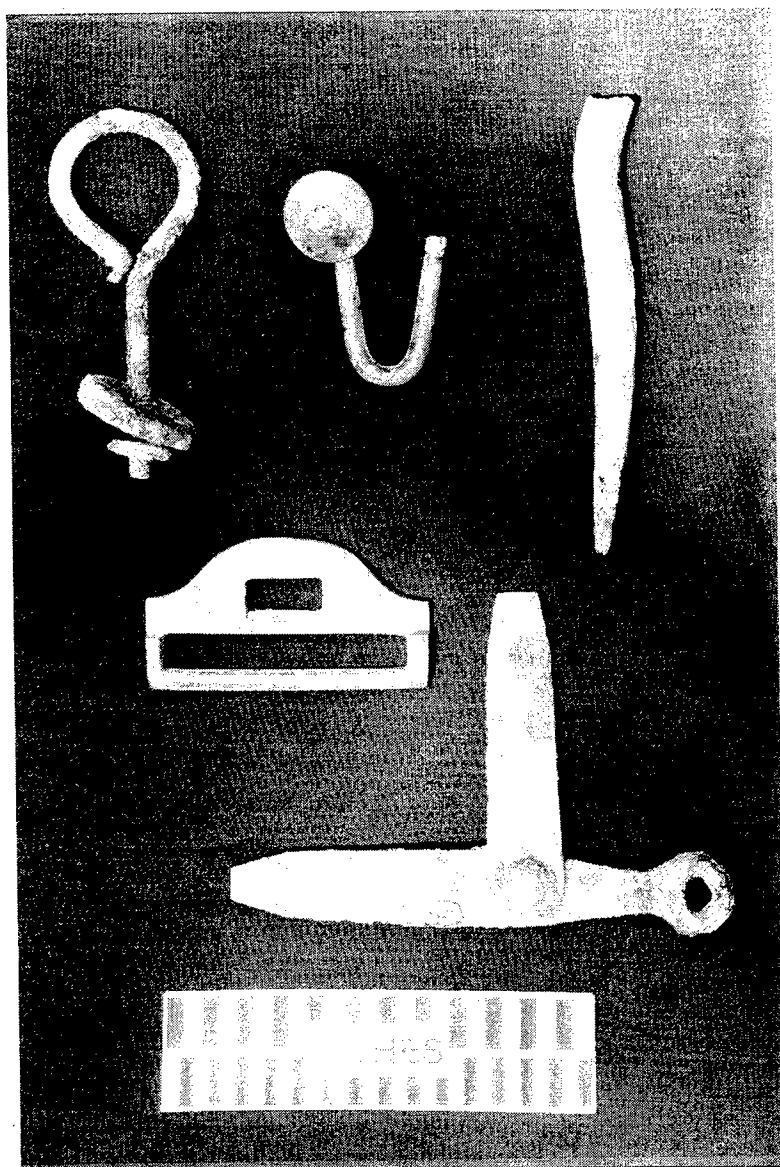


Plate 8. Fort Ellsworth (14EW26), Locality 6 artifacts (3-inch scale).

Top row (l-r) - stopper (ferrous/white metal) from a U.S. military canteen; strap adjustment hook (brass) for U.S. military knapsack; fractured iron rod (1/3 inch round stock) beveled at one end, perhaps a tent peg.

Middle - catch (brass) for U.S. military belt.

Bottom - appendage (ferrous) for U.S. military .58 caliber Springfield rifled musket.

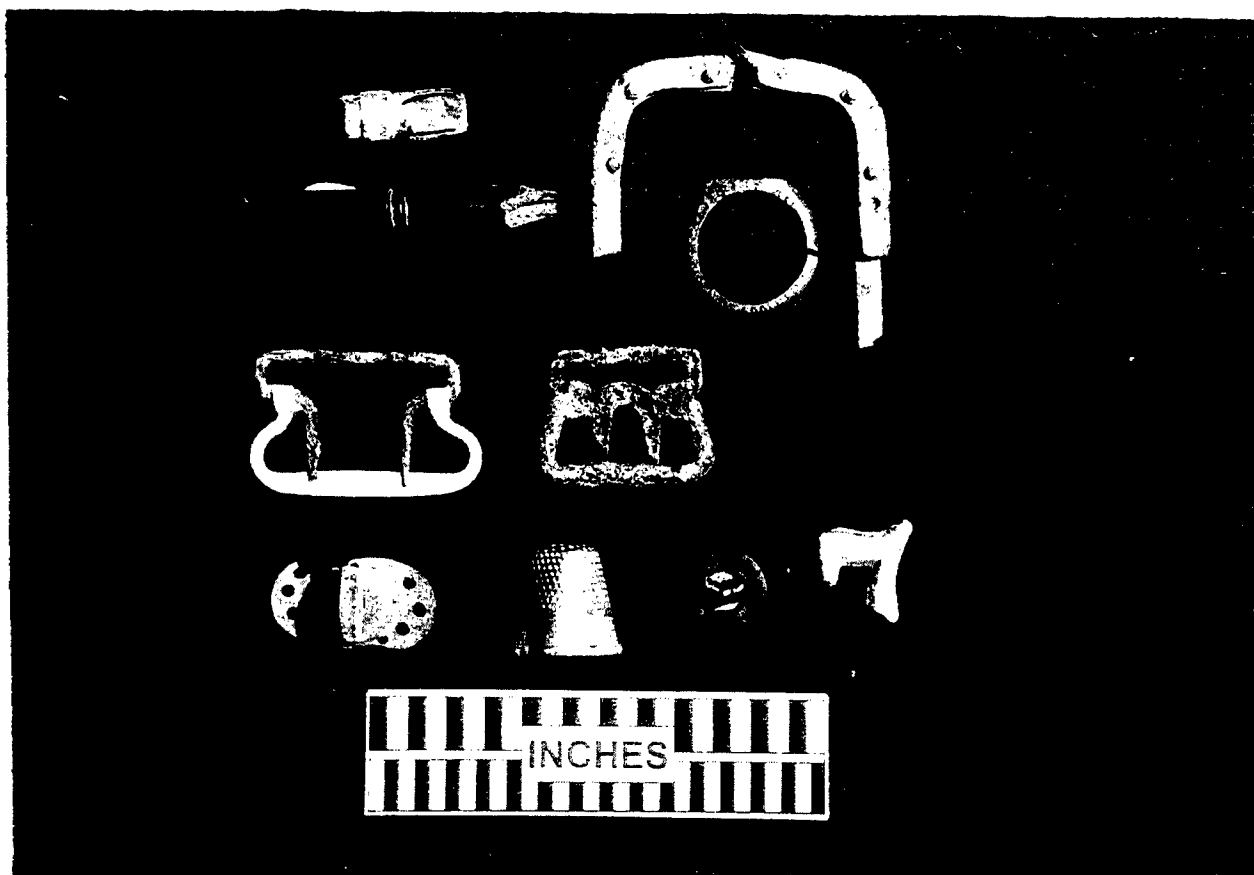


Plate 9. Fort Ellsworth (14EW26), Locality 6 artifacts (3-inch scale).

Top row (l-r) - pen and/or pencil parts; coin purse frame, ferrous; ring homemade from a Novelty Rubber Co. hard rubber button.

Middle row (l-r) - buckle (ferrous/cuprous) stamped PATENT 1855; buckle, ferrous

Bottom row (l-r) - U.S. military shoulder scale wing stud, brass; Forget-me-not thimble, non-ferrous; fancy hard rubber button backmarked NOVELTY RUBBER CO. GOODYEAR'S P=T 1851; U.S. military regimental insignia, stamped brass.

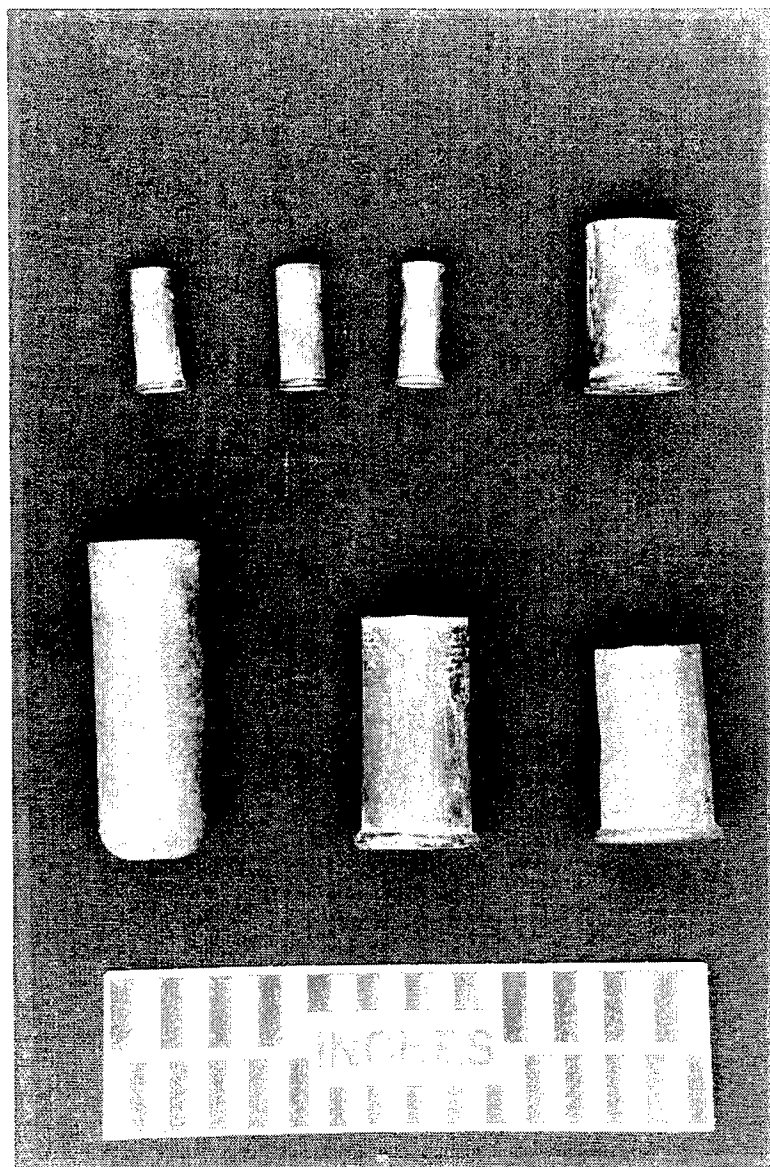


Plate 10. Fort Ellsworth (14EW26), Locality 6 cartridge cases (3-inch scale).

Top row (l-r) - .22 caliber Federal Cartridge Corp., headstamped "F"; .22 caliber Union Metallic, Remington-Union Metallic, and Remington, headstamped "U" (impressed); .22 caliber Remington-Union Metallic headstamped "U Hi Speed"; .44 caliber Henry (?) with multiple firing pin strikes.

Bottom row (l-r) - .50 caliber Gallagher, manufacturer unknown; .50 caliber Spencer headstamped "S.A.W.", Sage Ammunition Works; .50 or .52 caliber Spencer weak-strike headstamp "...V & Co." (F.V.V. & Co.), Fitch, Van Vechten and Co.

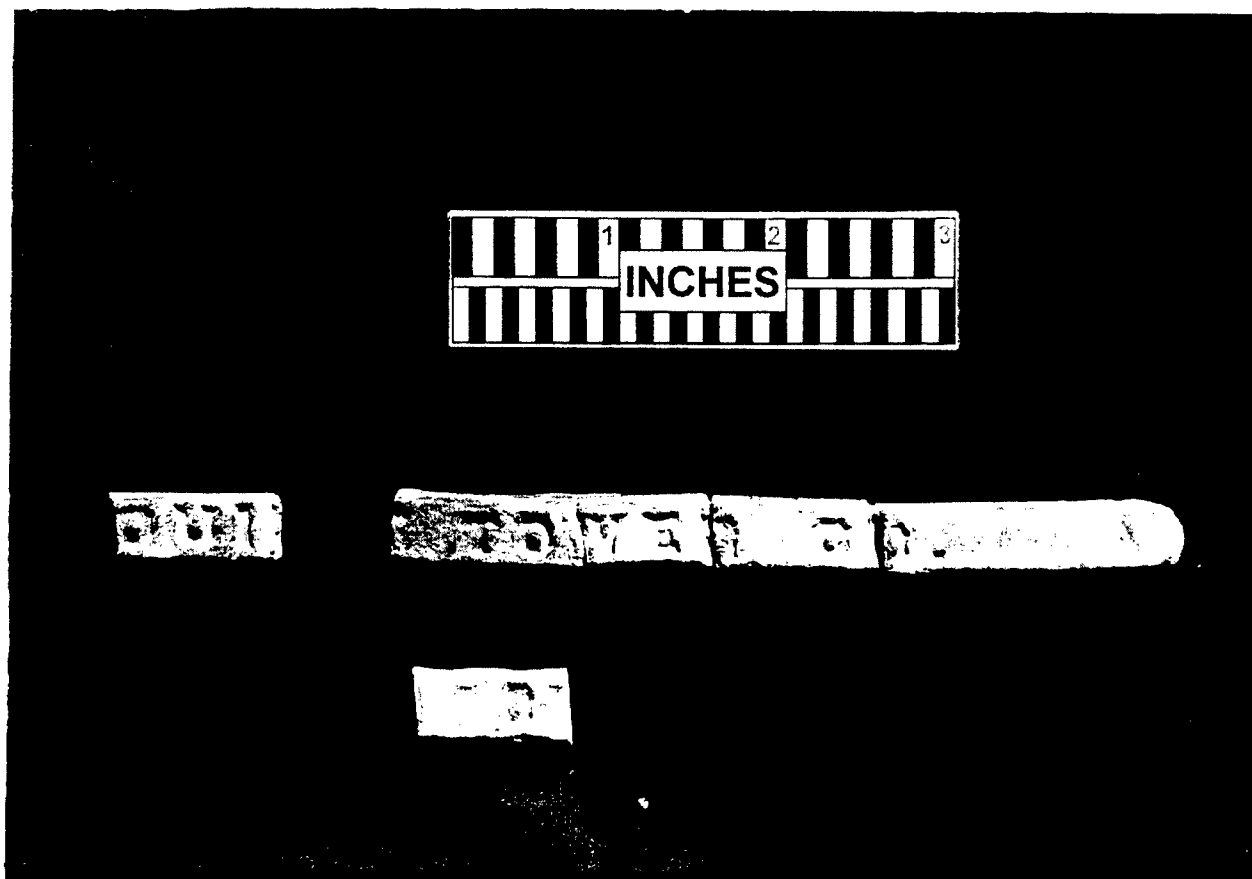


Plate 11. Lead shot bar fragments, St. Louis Shot Tower Co. Fort Ellsworth (14EW26), Locality 6 (3-inch scale).



Plate 12. Fort Ellsworth (14EW26), Locality 6 artifacts (3-inch scale).

Top - unidentified laminated lead object.

Middle row (l-r) - unidentified folded and stamped band, ferrous; unidentified ornamental band, stamped brass; unidentified iron strap, perhaps a strap slide from canteen.

Bottom row (l-r) - unidentified laminated lead object; unidentified non-metallic object, probably odd but natural sandstone formation; concha with unintelligible decoration, ferrous.

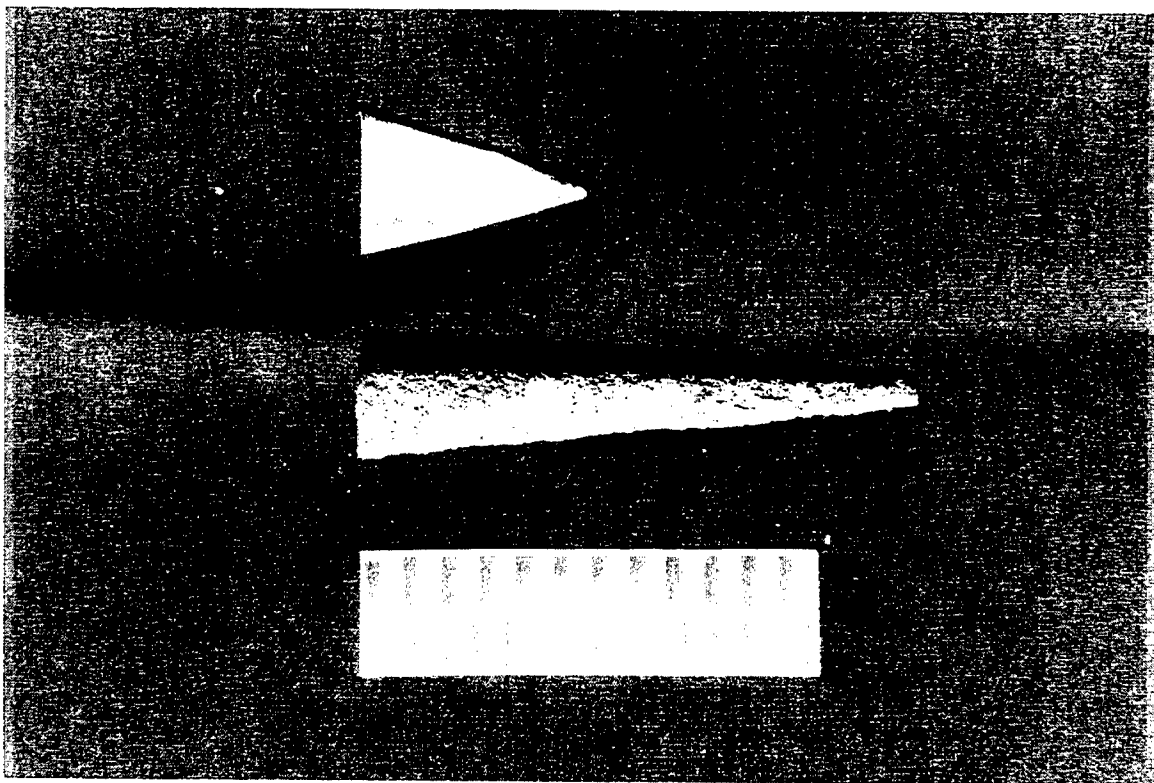


Plate 13. Cone tinklers; Upper, brass; Lower, ferrous. Fort Ellsworth (14EW26), Locality 6 (3-inch scale).

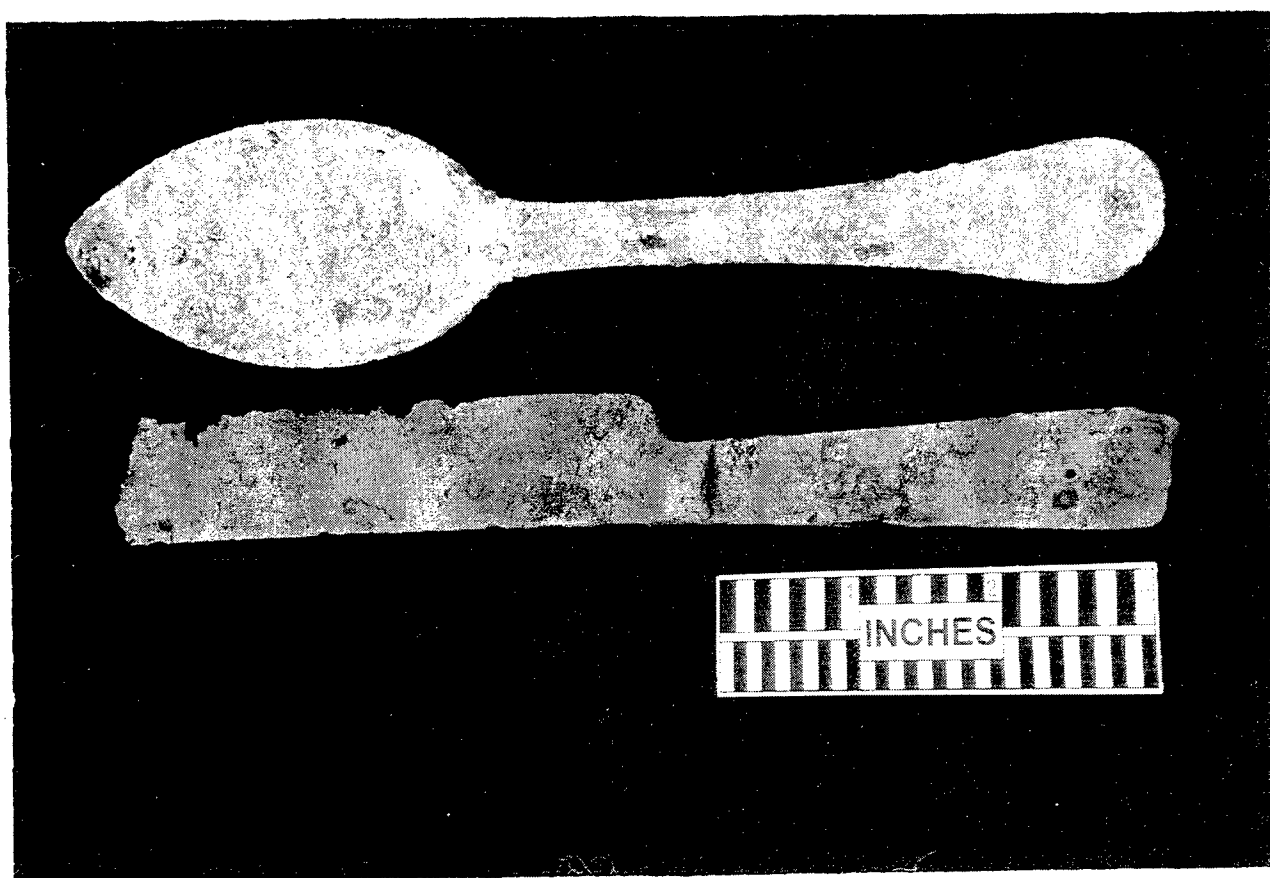


Plate 14. Utensils, ferrous. Fort Ellsworth (14EW26), Locality 6 (3-inch scale).

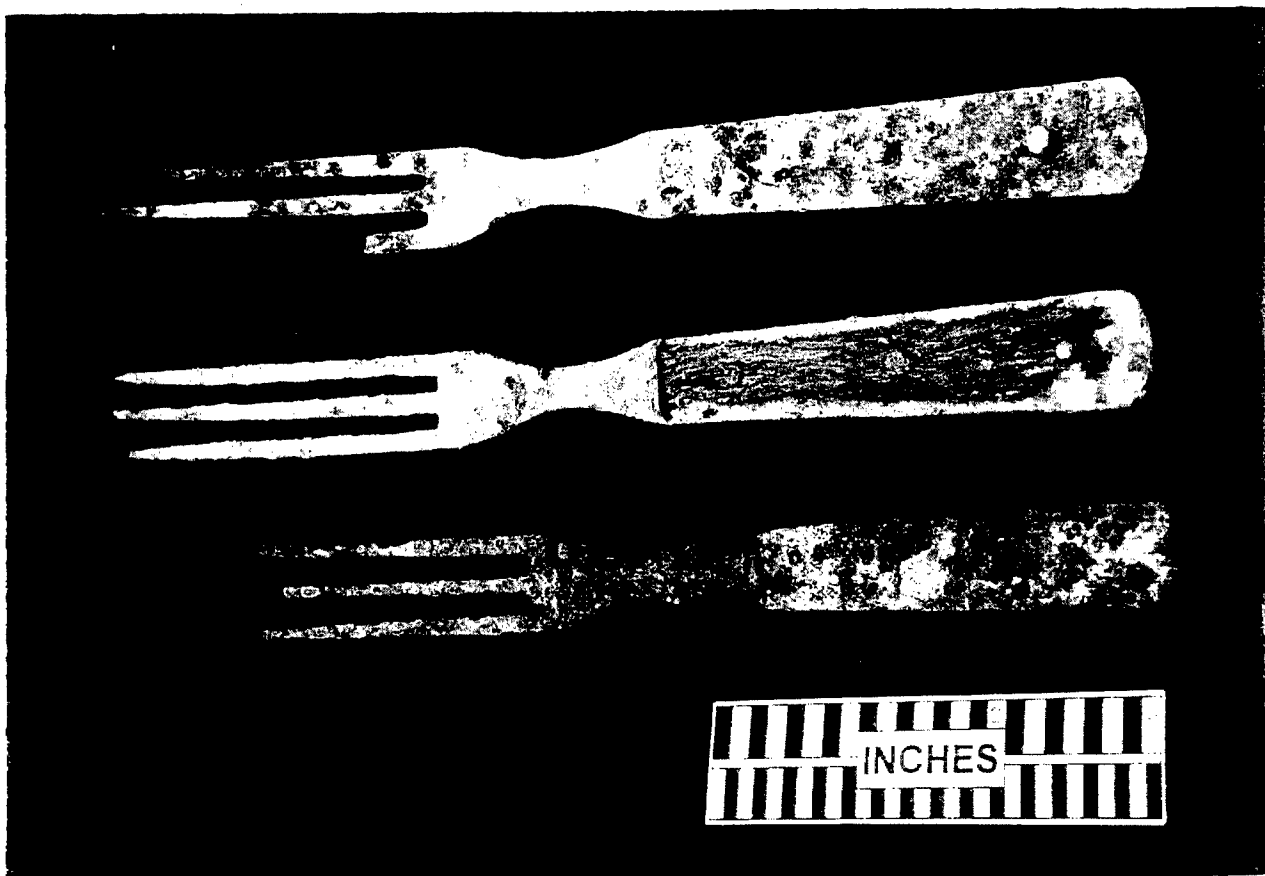


Plate 15. Forks, ferrous. Fort Ellsworth (14EW26), Locality 6 (3-inch scale).

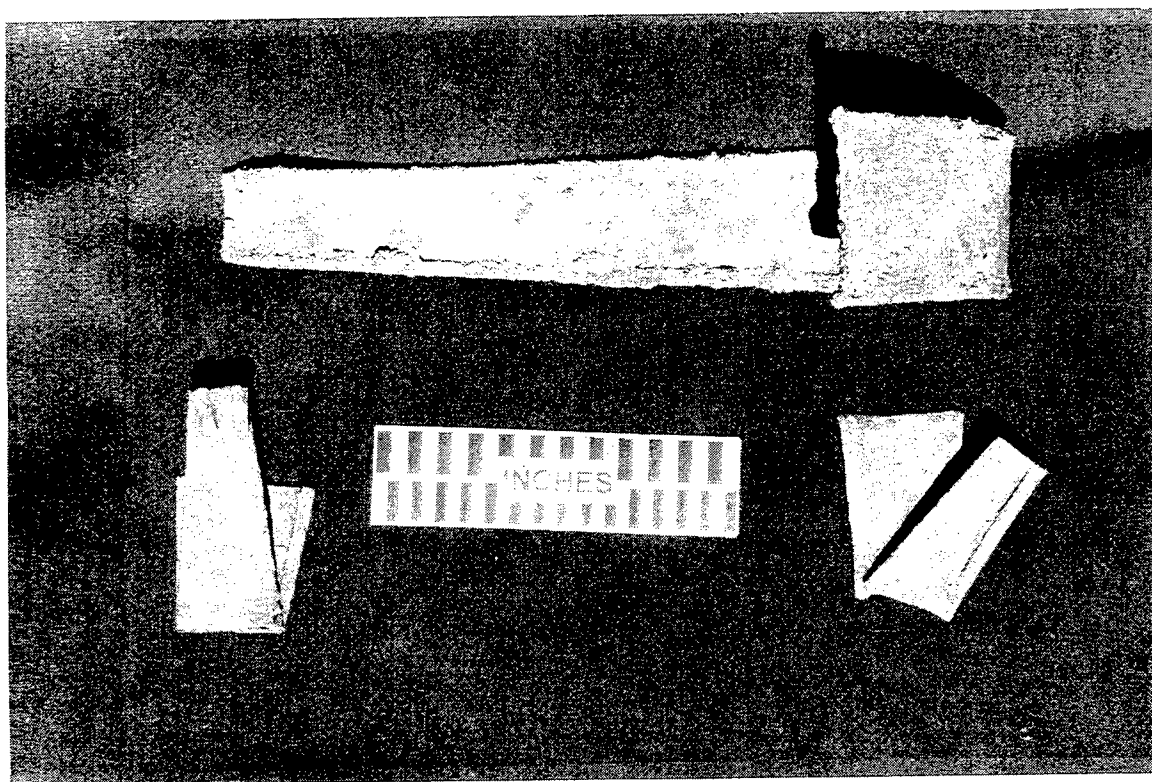


Plate 16. Cup and pot handles, ferrous. Fort Ellsworth (14EW26), Locality 6 (3-inch scale).

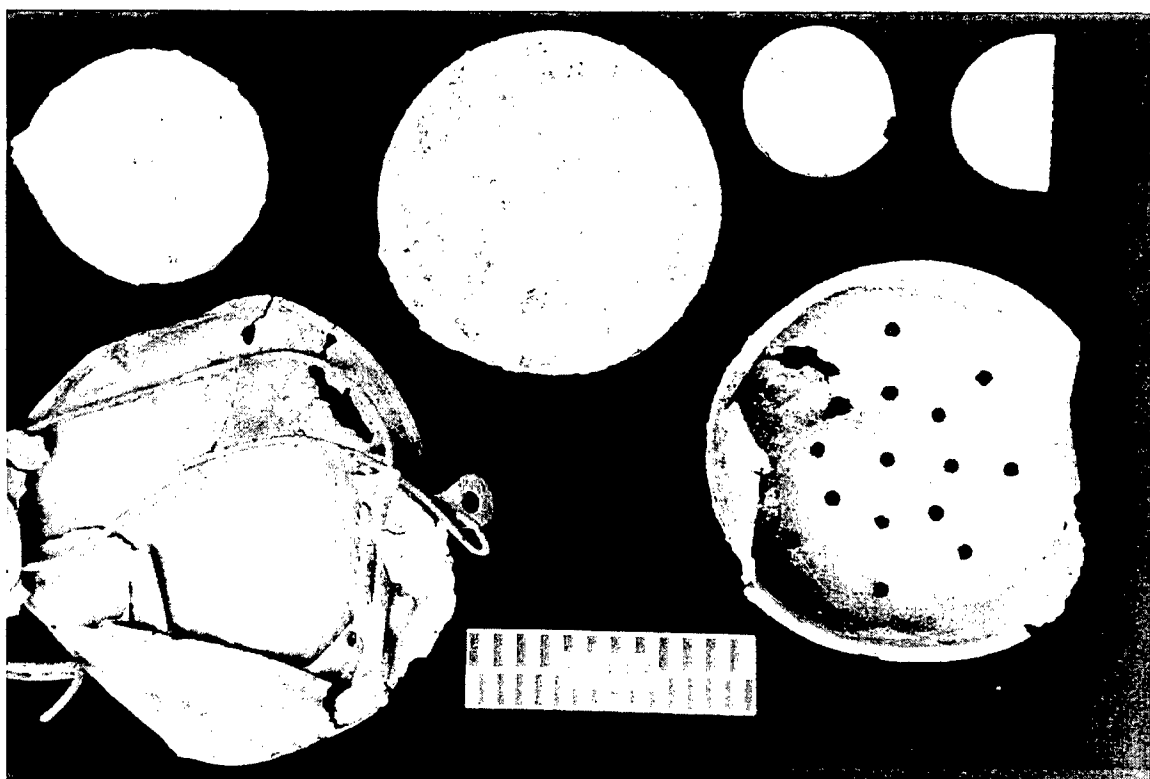


Plate 17. Fort Ellsworth (14EW26), Locality 6 artifacts (3-inch scale).

Top row (l-r) - friction lid, ferrous; friction lid ferrous; can end, ferrous; folded can end, ferrous.

Bottom row (l-r) - remnants of "mucket" pan, ferrous; machine-made strainer, ferrous.

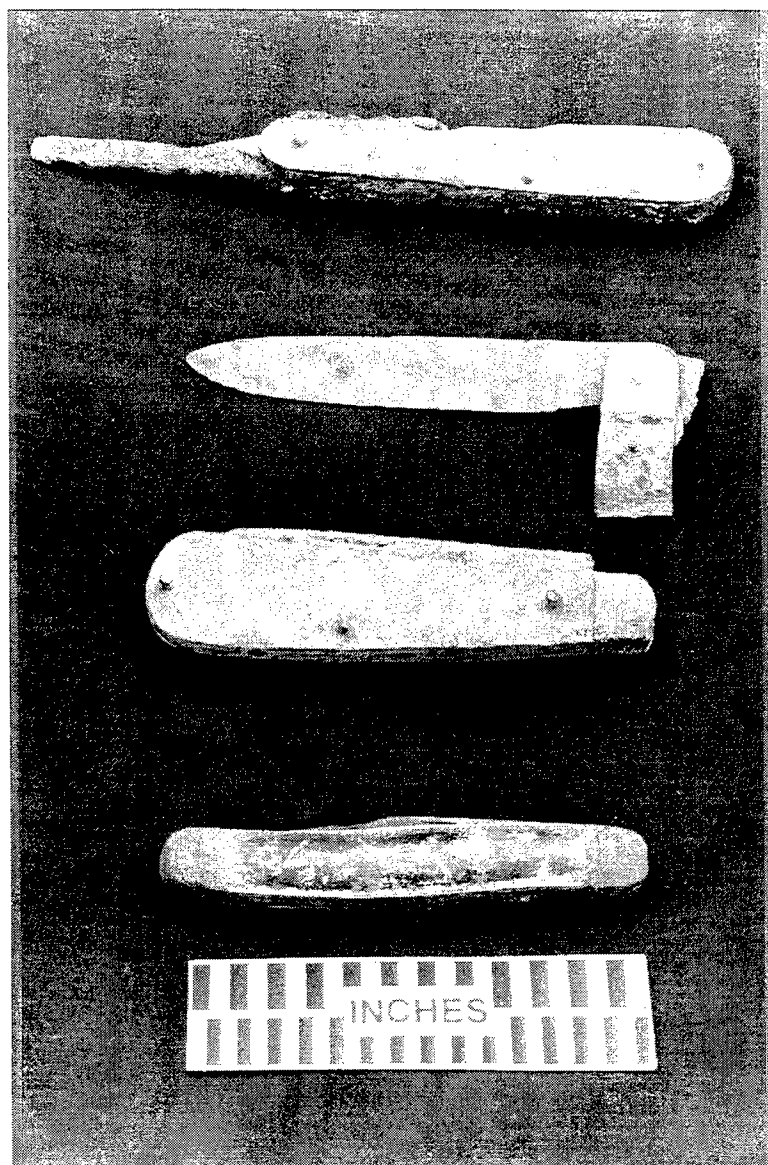


Plate 18. Folding knives, Top to Bottom: unidentified two-blade jack, two-piece handles missing; unidentified two-blade jack, body missing; two-blade boy's jack, two-piece handle missing; two-blade premium jack, bone handle with DE monogram (Diamond Edge). Fort Ellsworth (14EW26), Locality 6 (3-inch scale).

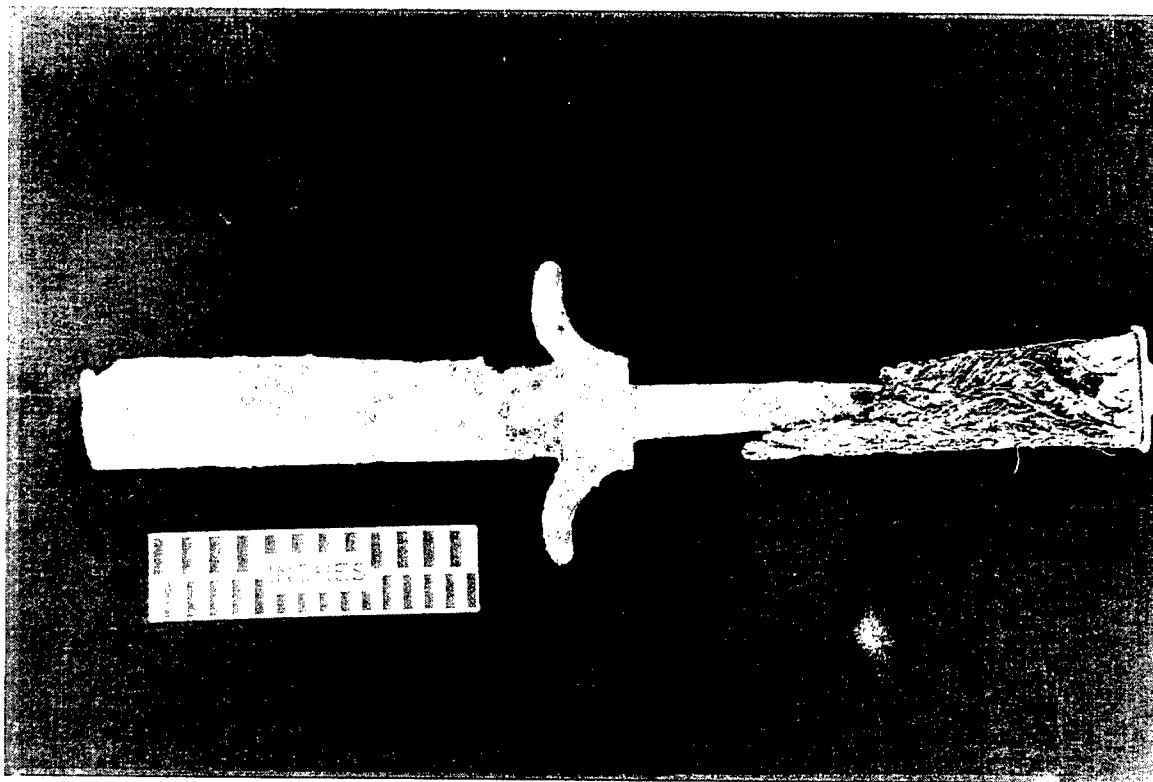


Plate 19. Unidentified hunting knife with part of wood handle. Fort Ellsworth (14EW26), Locality 6 (3-inch scale).

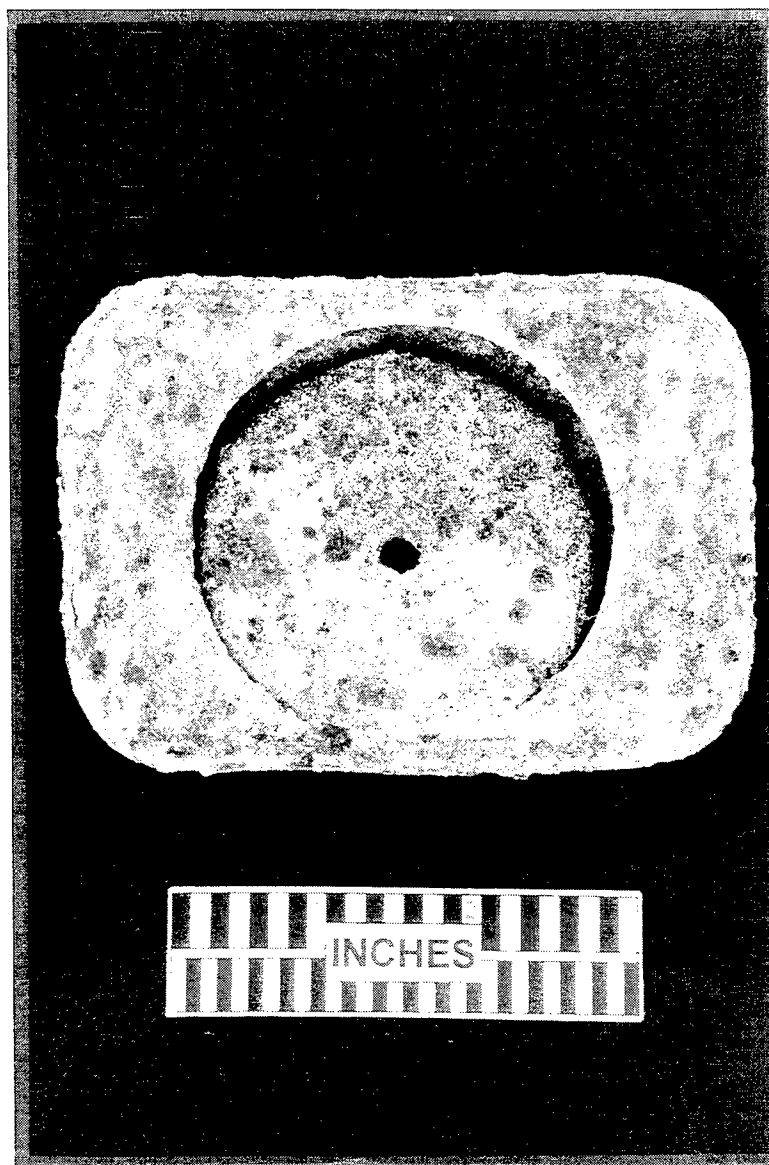


Plate 20. Top view of Chaigneau Sons sardine tin. Fort Ellsworth (14EW26), Locality 6 (3-inch scale).



Plate 21. Complete bottles, Fort Ellsworth (14EW26), Locality 6 (3-inch scale). Left, ornate "peppersauce" bottle; Top center, conical ink bottle, finish missing; Bottom center, prescription or perfume bottle (clear); Right, C.H. Swain's Bourbon Bitters (amber).

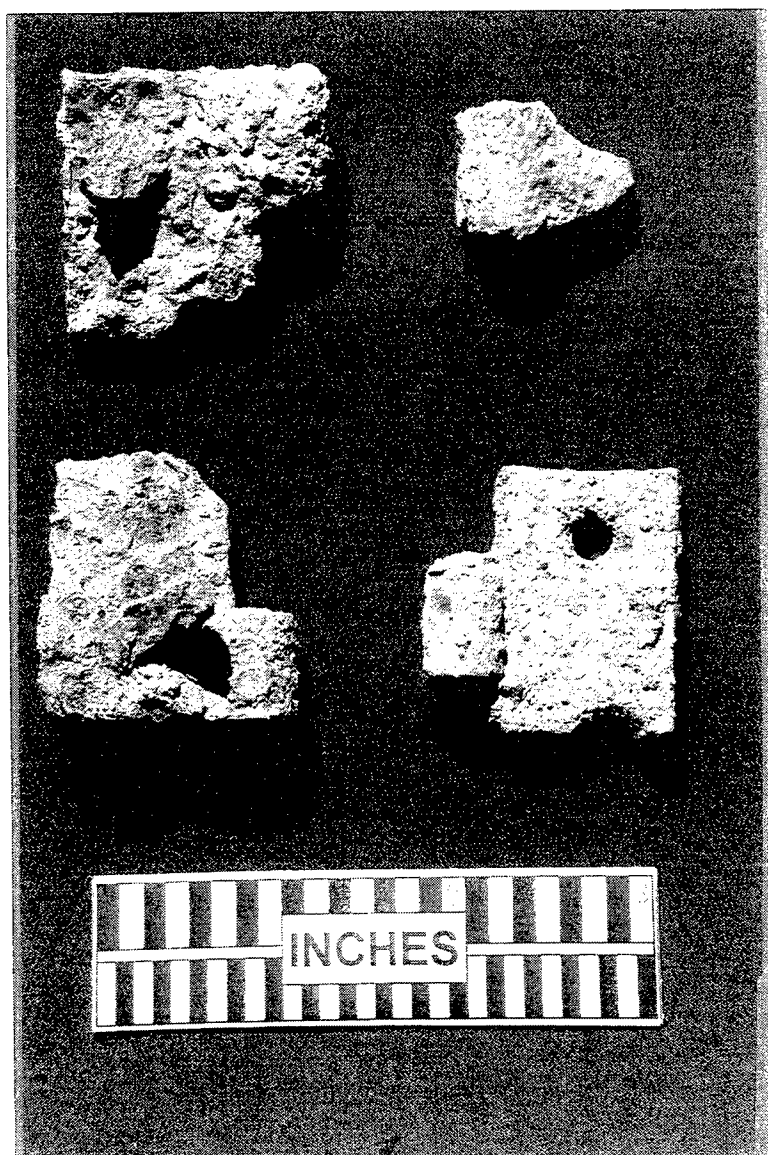


Plate 22. Rectangular butt hinge fragments. Two on left were secured with nails. Fort Ellsworth (14EW26), Locality 6 (3-inch scale).



Plate 23. Part of a Model 1858 U.S. canteen. Fort Ellsworth (14EW26), Locality 6 (3-inch scale).

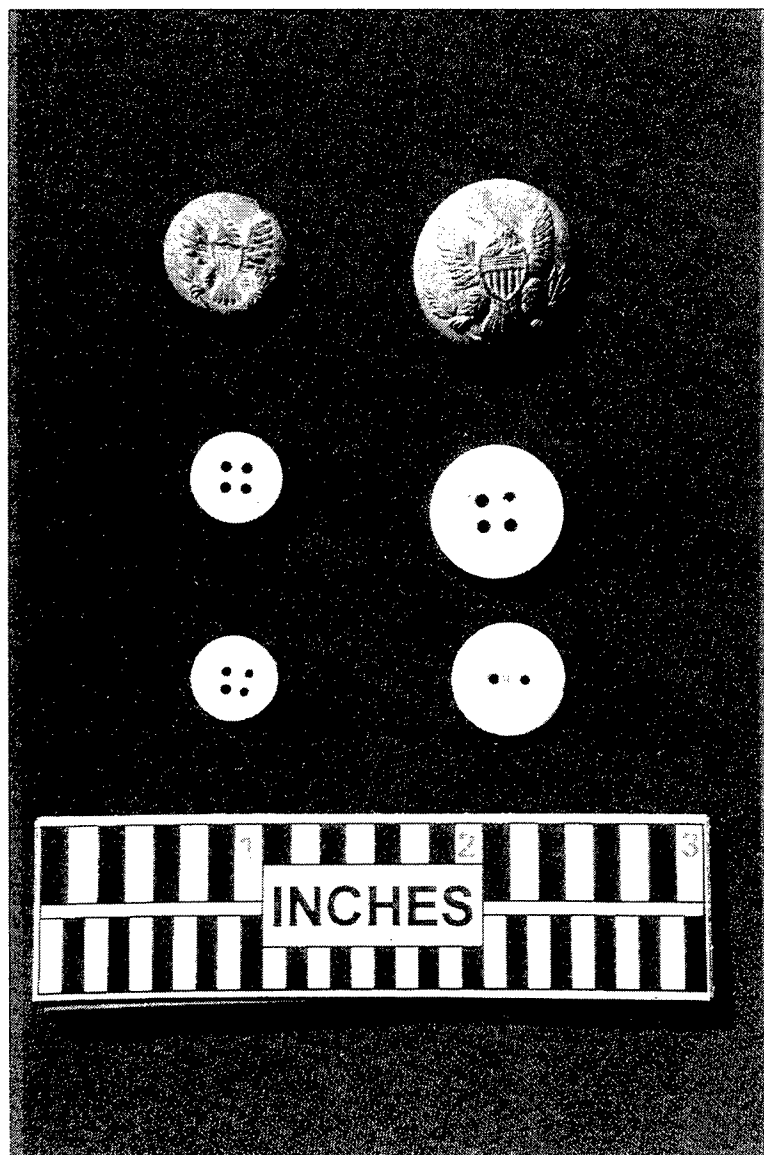


Plate 24. Buttons. Top row - U.S. general service line-eagle device buttons, 1851-1884; middle row - 4-hole milk glass buttons; bottom row - shell buttons. Fort Ellsworth (14EW26), Locality 6 (3-inch scale).

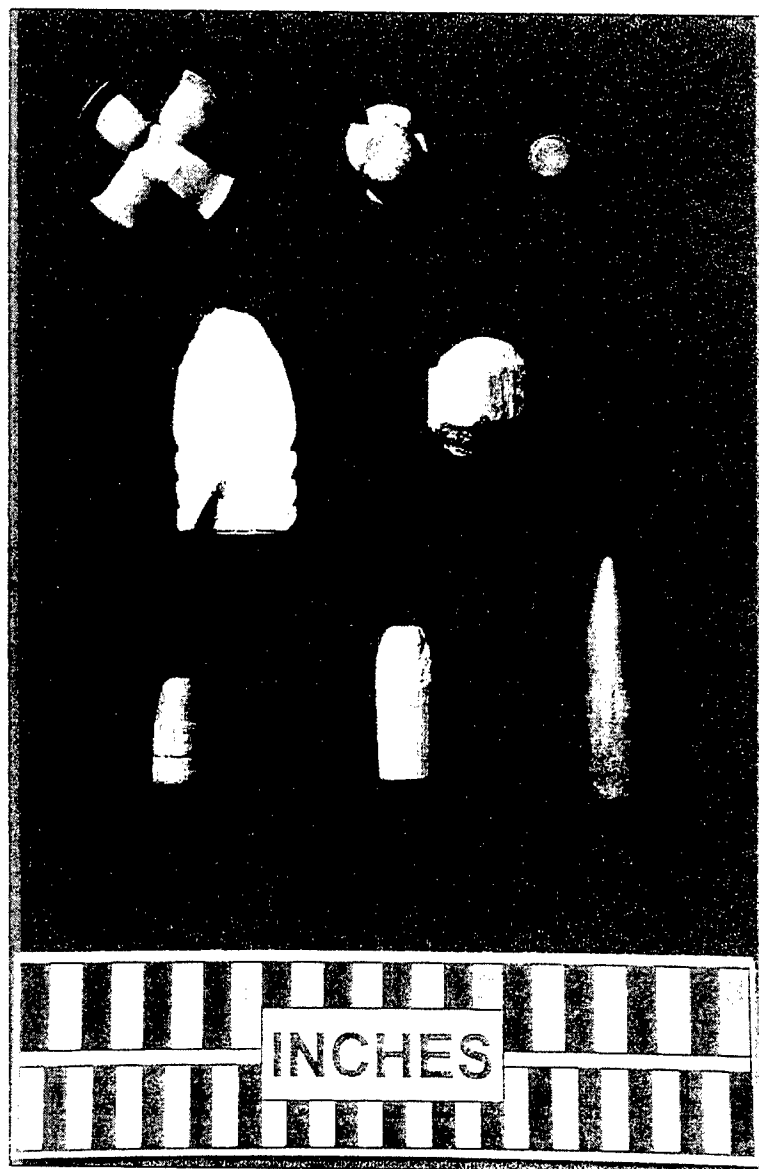


Plate 25. Ammunition components. Fort Ellsworth (14EW26), Locality 6 (3-inch scale).
Top row - percussion caps (l-r); top hat (splayed); top hat; cup.
Middle row (l-r) - .58 caliber bullet sliced in half; .44 caliber ball fired in rifled firearm.
Bottom row (l-r) - .22 caliber bullet; .25 caliber bullet; .30 caliber bullet, copper jacketed.

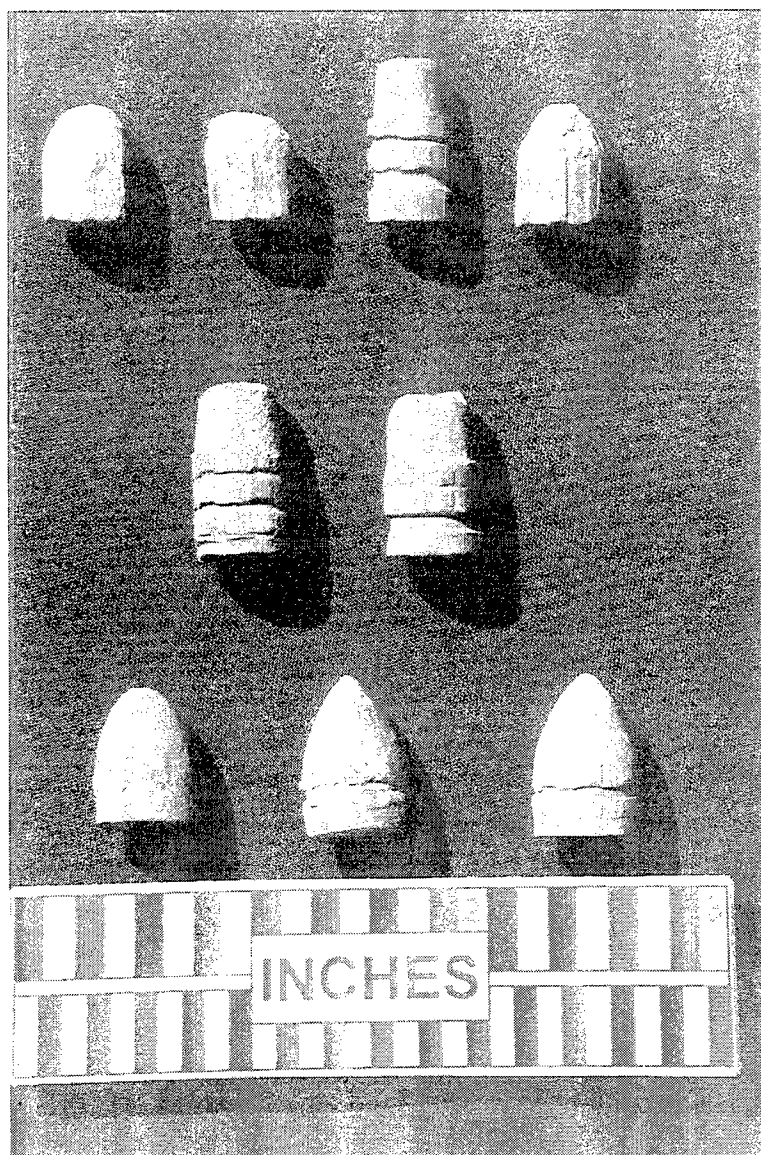


Plate 26. Bullets. Fort Ellsworth (14EW26), Locality 6 (3-inch scale).

Top row (l-r) - .36 to .38 caliber bullet; .36 to .38 caliber bullet; .38 Special or .357 Magnum bullet; .38 caliber revolver(?) bullet.

Middle row (l-r) - .44 Special or .44 Magnum raised-ridge bullet; .44 Special or .44 Magnum raised-ridge bullet.

Bottom row - .44 caliber bullets; first two probably Colt Army, Early Model bullets; far right is a probably a bullet for .44 Colt revolvers.

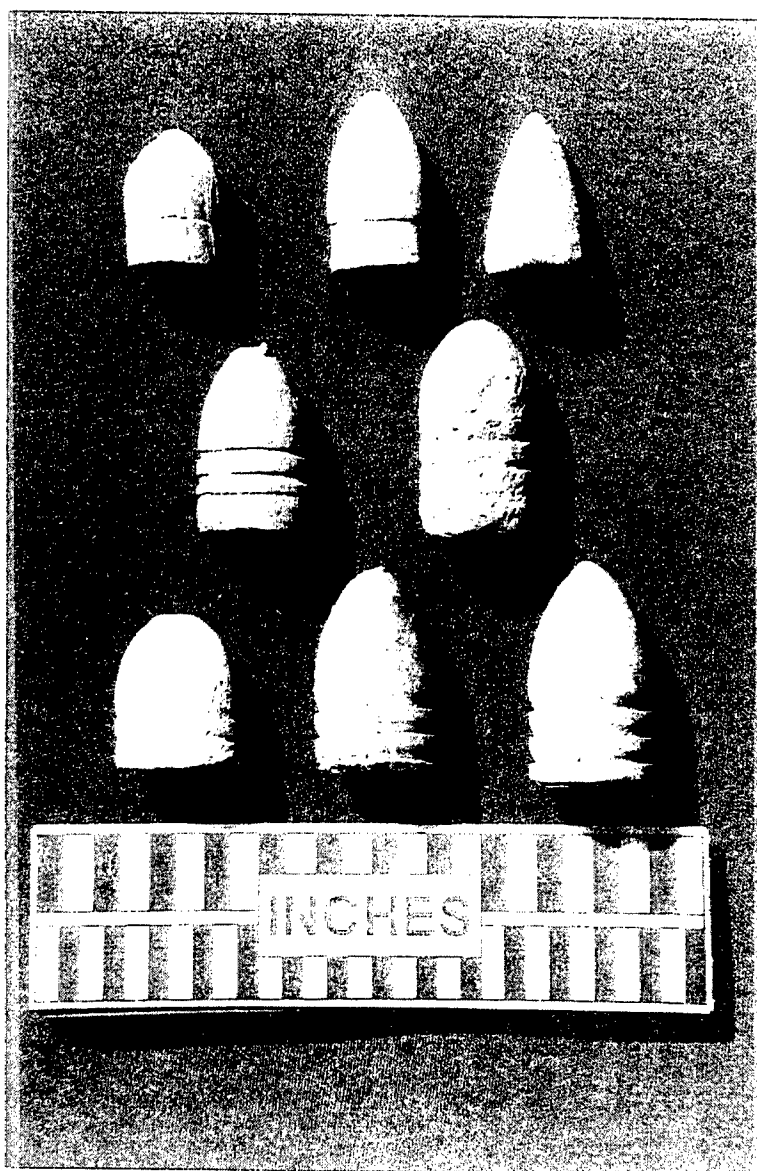


Plate 27. Bullets. Fort Ellsworth (14EW26), Locality 6 (3-inch scale).

Top row (l-r) - unknown .44 caliber revolver(?) bullet; .44 caliber bullet with pin base probably used in Colt Dragoon or Army revolvers, or Colt repeating rifle; picket-type .46 caliber bullet for country rifle.

Middle row (l-r) - .52 to .54 caliber bullet probably for Merrill carbine; .54 caliber Gallagher bullet.

Bottom row (l-r) - unidentified snub-nose bullet, probably .58 caliber; bullet for .58 caliber rifle or rifled musket; bullet probably for .577 caliber rifle or rifled musket.

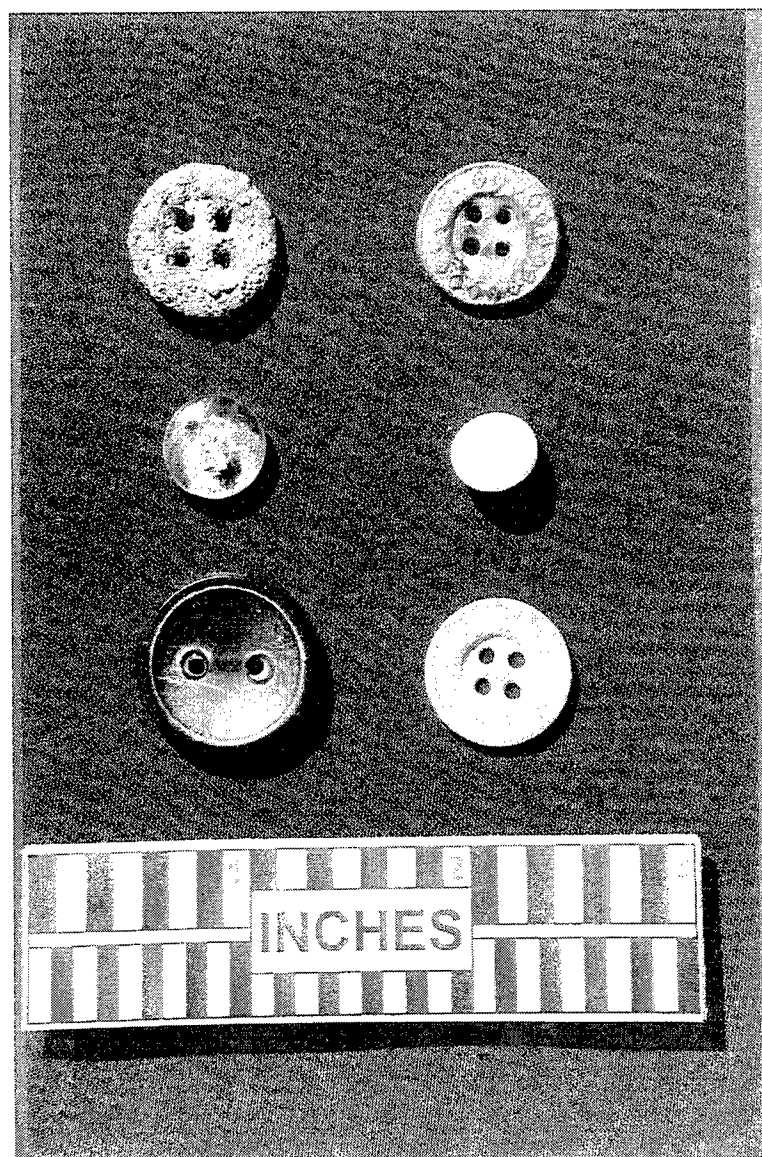


Plate 28. Buttons. Fort Ellsworth (14EW26), Locality 6 (3-inch scale).

Top row (l-r) - 4-hole, two-piece iron; 4-hole decorated.

Middle row - clear glass shank button; milk glass shank button.

Bottom row (l-r) - Novelty Rubber Co. hard rubber button; one-piece, 4-hole pewter or white metal button.

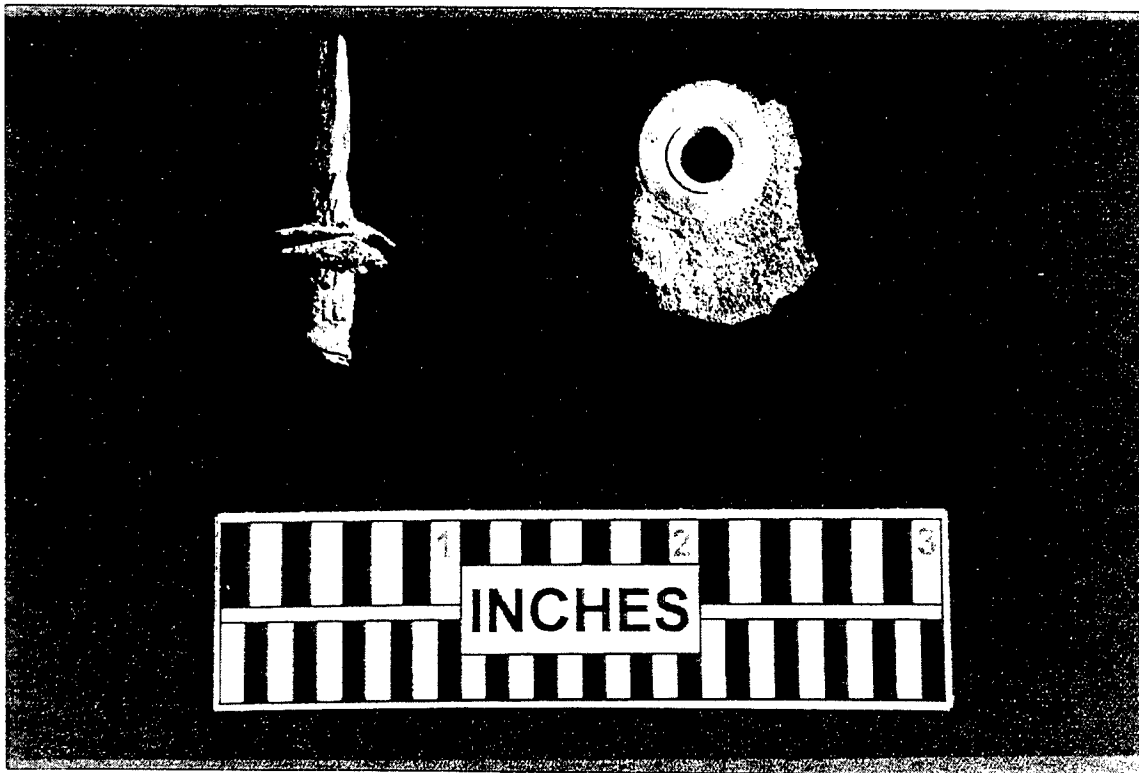


Plate 29. Left - grommet with nail driven through it; grommet with leather adhering. Fort Ellsworth (14EW26), Locality 6 (3-inch scale).

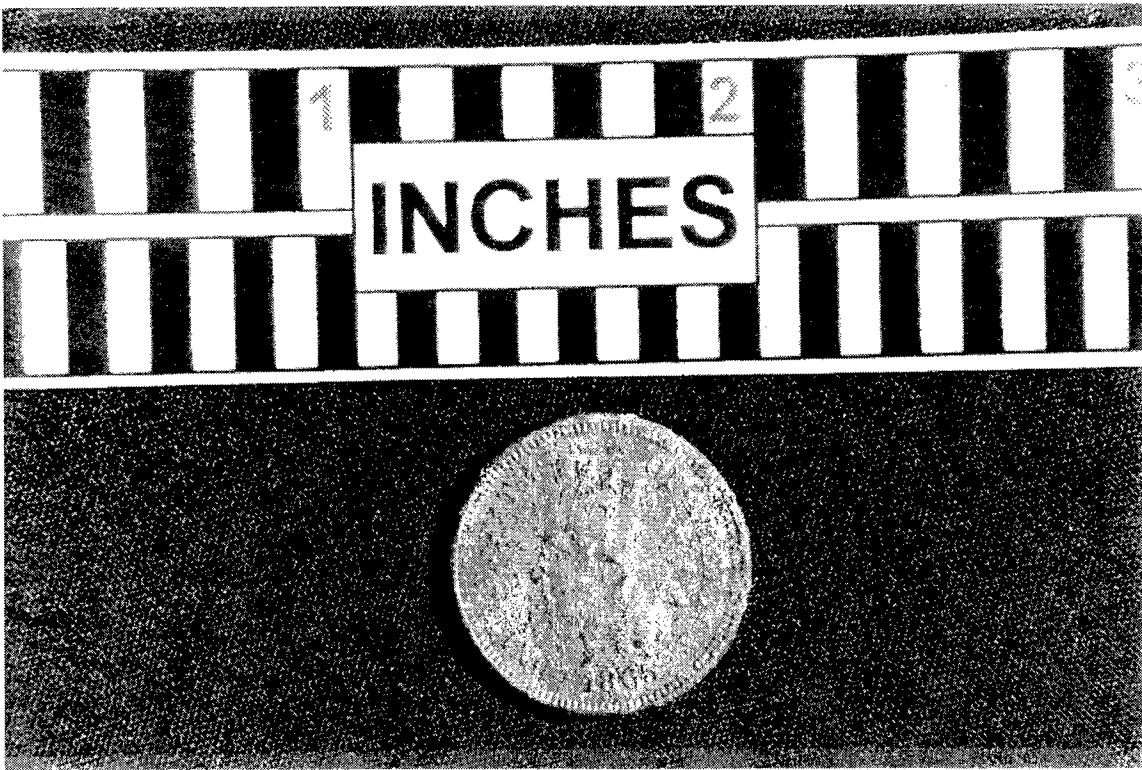


Plate 30. Obverse, 1865 "Indian head" one-cent piece. Fort Ellsworth (14FW26). Locality 6 (3 - inch scale).

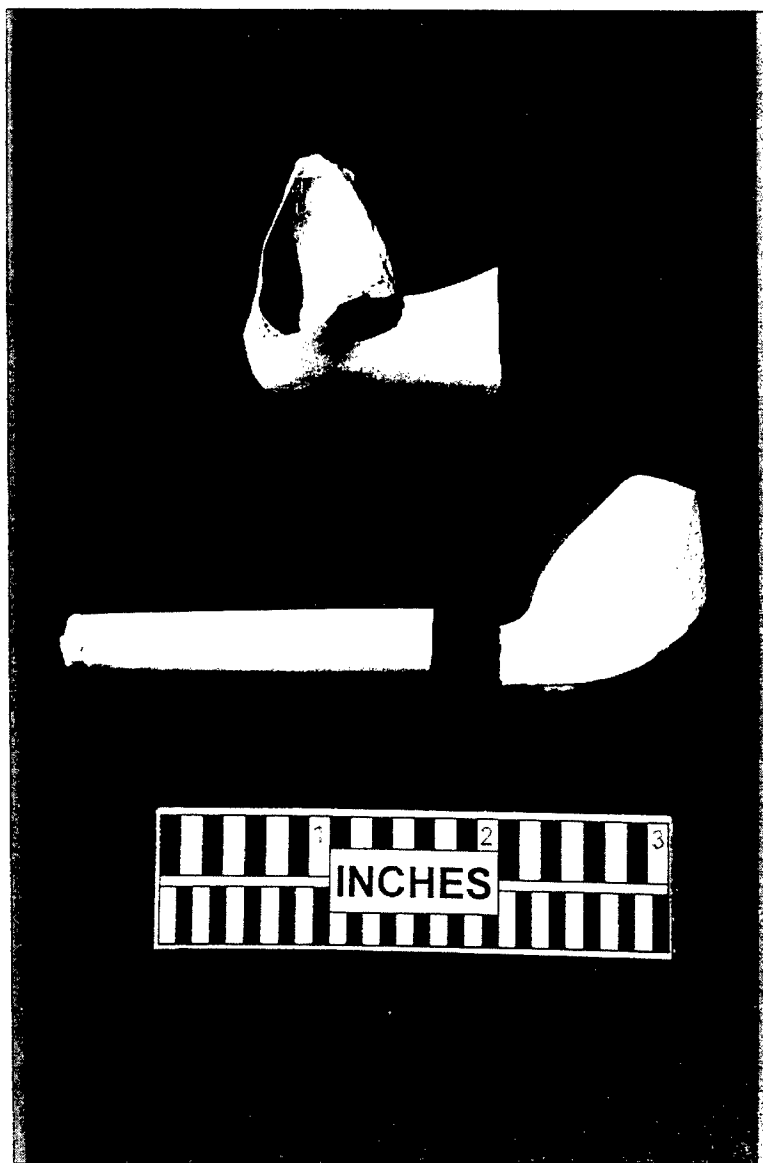


Plate 31. Remains of a buff-color clay pipe bowl; remains of a white clay pipe stem and bowl. Fort Ellsworth (14EW26), Locality 6 (3 - inch scale).

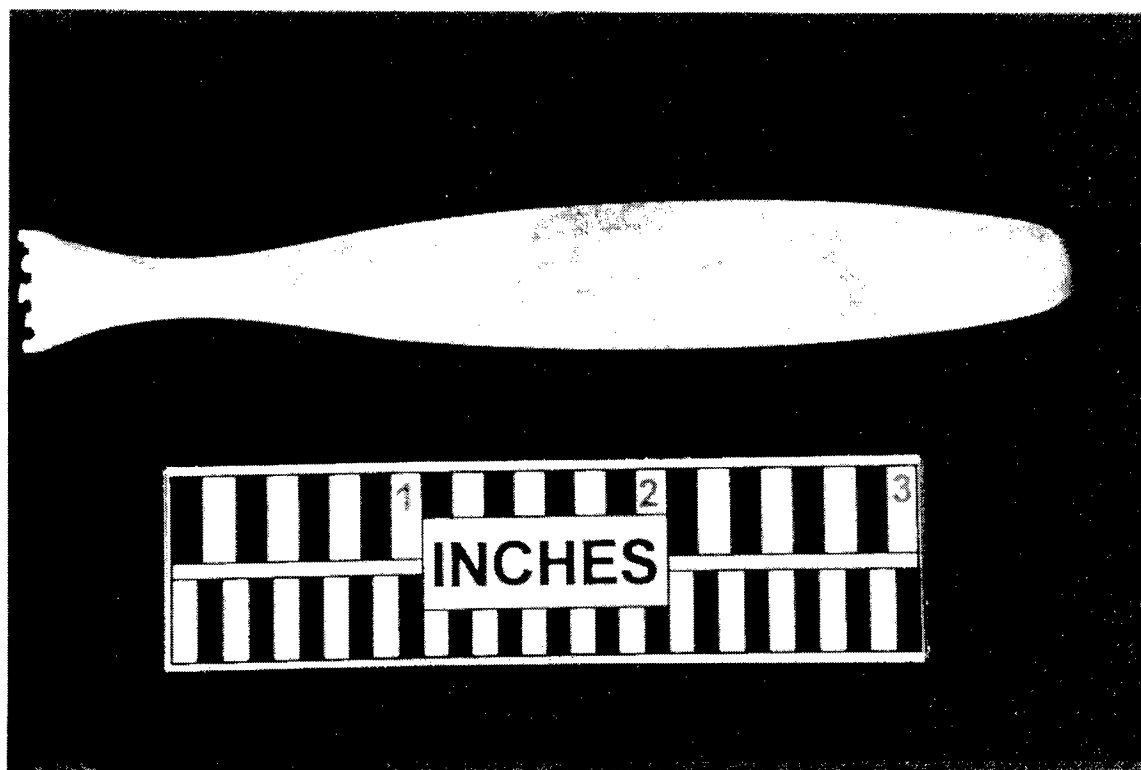


Plate 32. Monogrammed brush handle of unknown material. Fort Ellsworth (14EW26), Locality 6 (3 - inch scale).

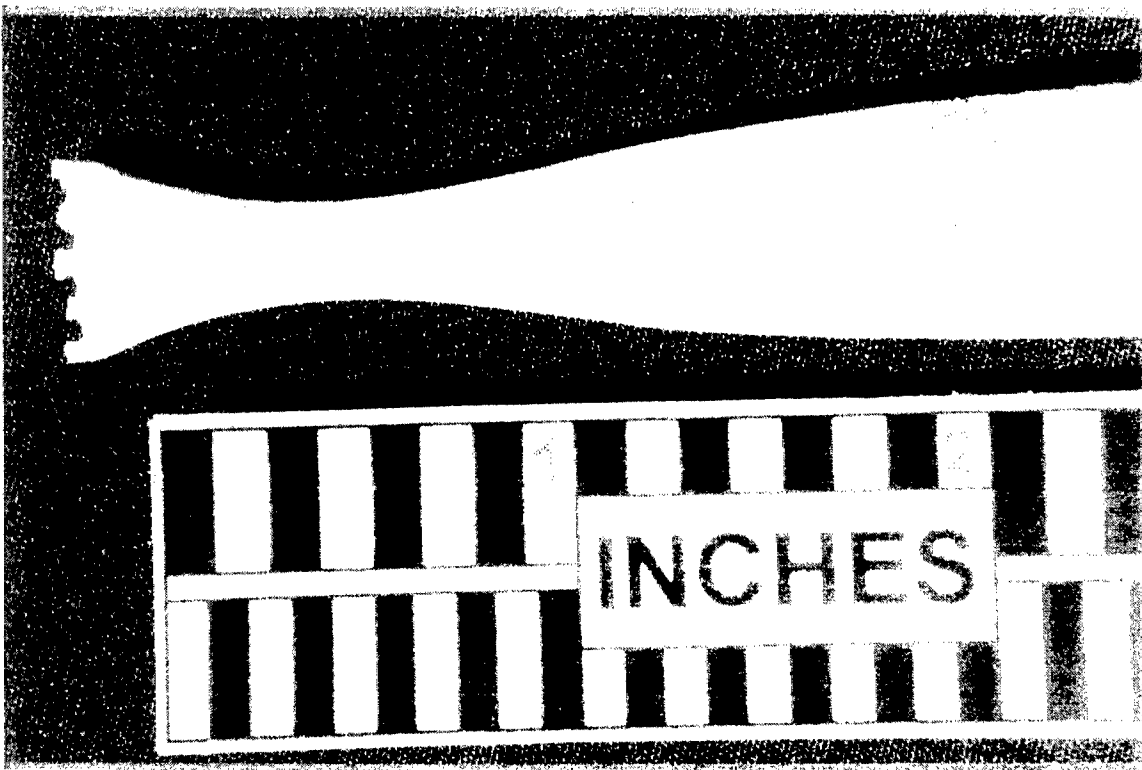


Plate 35. Closeup of branch handle showing micro-scan detail. Fort Ellsworth (ME W26)
Locality 6 (3 x inch-scale)

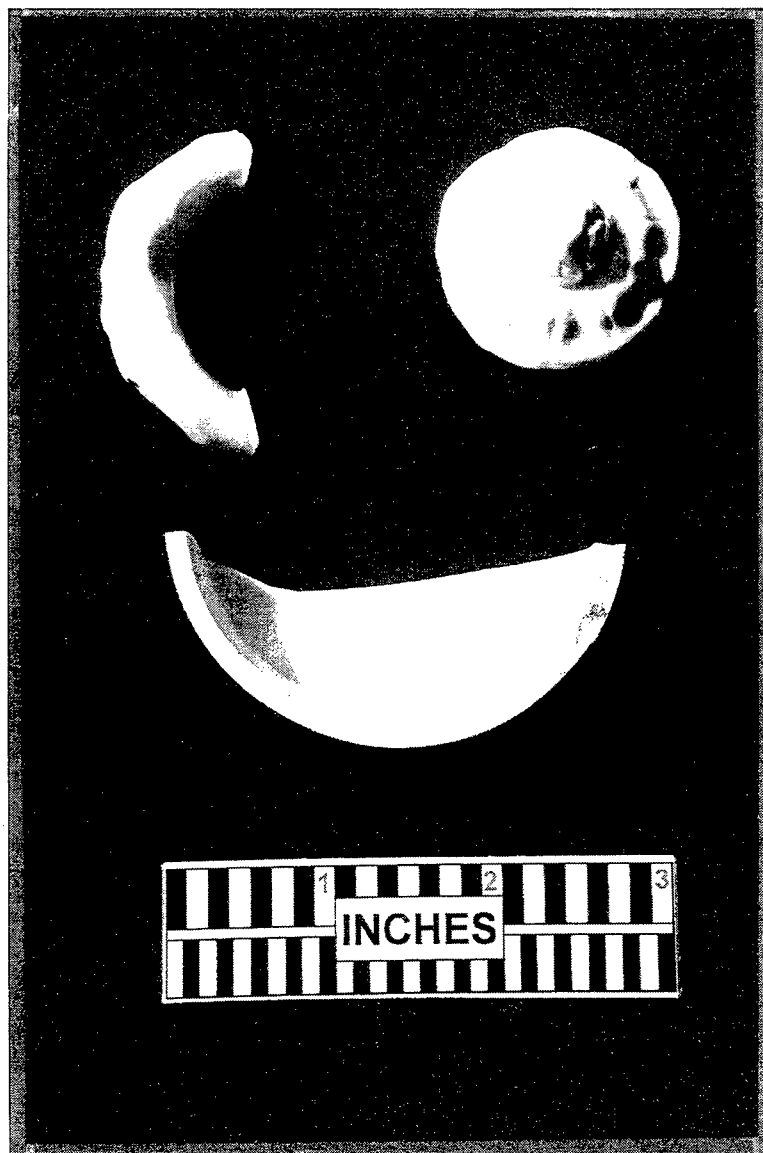


Plate 34. Whiteware ceramic sherds. Left - mold decorated lug; right - decorated knob from lid; bottom - coaster or lid. Fort Ellsworth (14EW26), Locality 6 (3 - inch scale).

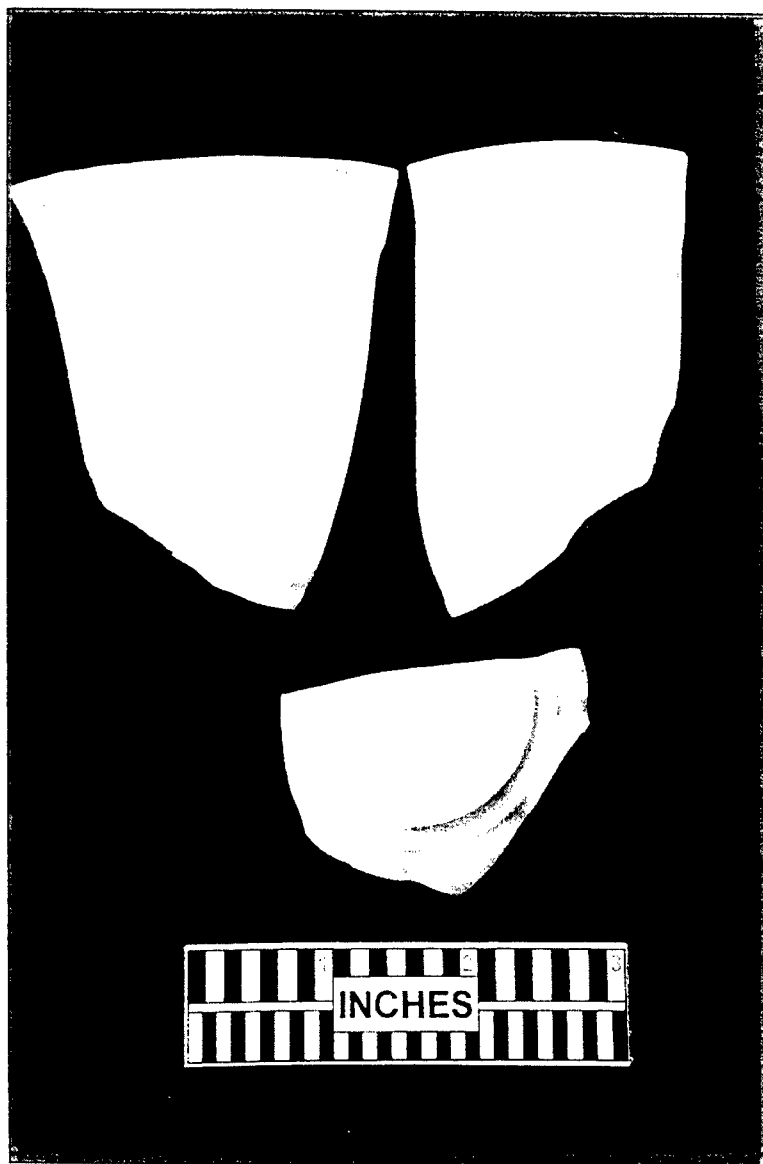


Plate 35. Sherds from whiteware cup or bowl with vine and bud rim design; top two refit.
Fort Ellsworth (14EW26), Locality 6 (3 - inch scale).